VOSA Equipment Specification

LARGE VEHICLES (HGV AND PSV - Category M2; M3; N2; N3; O3; O4)

ROLLER BRAKE TESTER

FOR TESTING BRAKING EFFICIENCY

Issue date June 2011

IMPORTANT: THIS DOCUMENT SHOULD BE READ IN CONJUNCTION WITH THE AUTHORISED TESTING FACILITY CONDITIONS OF APPOINTMENT REQUIREMENTS.

IF A MULTI CLASS APPROVAL IS REQUIRED THEN REFERENCE MUST BE MADE TO THE RBT SPECIFICATION FOR THE RELEVANT CLASS OF VEHICLE.

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1. INTRODUCTION

This Specification details the MINIMUM performance and constructional requirements for Roller Brake Testers (RBTs) intended to be used for the statutory annual brake performance testing of Large Goods and Public Service (Class VI vehicles). These vehicles are tested in accordance with the Motor Vehicle (Tests) Regulations and for Heavy Goods Vehicles in accordance with the Goods Vehicles (Plating and Testing) Regulations 1988, as amended.

The Specification does not rule out additional features supplied with the equipment provided that the features are acceptable on health and safety grounds and do not prevent or make it less efficient to carry out the test as prescribed.

2. TECHNICAL REQUIREMENTS

The RBT shall consist of a pair of roller sets mounted in the ground, or within a raised floor, with a separate display console. The RBT shall be safe to use, robustly constructed to acceptable engineering standards and suitable for brake testing of Heavy Goods and Public Service vehicles. The RBT must utilise a Computer - Controlled System (CCS).

2.1 Computer Control System

A fully detailed specification of the CCS requirements can be found in **ANNEX 1**

Note that VOSA staff may need to operate several different models of RBT each week. It is important therefore that the CCS provides sufficient prompts and guidance to allow ease of use.

In particular the display should indicate, prior to the test sequence commencing, what braking systems are to be tested for the vehicle chosen and to which axles those systems apply.

2.2 Roller Set

The roller sets shall have;

a. a means of preventing either roller set operating unless a wheel is correctly located in it.

Note: Except following calibration (see Section 3.1 below).

b. the ability to be driven independently or simultaneously by the use of suitable controls.

c. a means of manually stopping either or both roller sets.

d. an automatic means of stopping either roller set individually when the tyre to roller slip reaches a pre-set limit. Variable slip limits are defined further in Annex 1 appendix 15.

e. the ability to measure a maximum value of no less than **4000 kg** brake force per wheel when progressive brake test is made.

f. the ability to measure a maximum value of no less than **3000 kg** brake force per wheel when the parking brake is tested in the ‘applied mode’ whereby the parking brake is fully applied prior to the rollers being started.

g. the capability of accepting a maximum axle load no less than **13000 kg.**

h. a clear, durable marking showing the normal forward ‘drive-on' direction of the RBT.

i. no part protruding more than 100 mm above the floor surface.

If a cross-pit RBT is offered for approval, a suitable protection device shall be installed to prevent the rollers from being started when a person is in the pit within reaching distance of the RBT.

Note 1: Manufacturers should be aware that ATF Requirements found in Schedule 1 of the ATF Contract states that when a cross-pit RBT is installed for MOT use, the length of pit taken up by the RBT shall be in addition to the length of pit specified for the under-vehicle inspection. To meet this requirement, a distance of 1.5 metres will be added to the minimum pit length required. The extra 1.5 metres will be measured to the edge of the first aperture in the top of the RBT.

2.3 Rollers

The rollers shall have;

a. a surface that is durable and not likely to cause undue tyre damage. A gritted roller is not mandatory however where issues arise in service then a gritted roller must be available as a retrofit option.

b. a roller to tyre co-efficient of friction of not less than 0.7µ dry, 0.6µ wet .

c. the following dimensions;

i)	minimum diameter	**200 mm**	(Roller diameter of 150mm for on ground RBT see ISO21069 Section A1.2)
ii)	not greater than	**500 mm**	between roller centres
iii)	not greater than	**880 mm**	between inner ends of the high friction surfaces of the left and right rollers
iv)	not less than	**2600 mm**	between outer ends of the high friction surfaces of the left and right rollers

d. (when running) a constant surface speed in the range 2 to 5.5 km/h. See ISO 21069 A2 para1 page 9

Note 1: The speed of the rollers shall remain within the specified range throughout the full range of brake force.

Note 2: The speed requirement does NOT apply to the applied parking brake test (see Section 2.2 f above).

2.4 Brake Force Display

The brake force display shall;

a. indicate in units of kilogram force (kgf)

b. indicate the brake force individually for each wheel on an axle.

c. be analogue and sufficiently sensitive to show the variations in brake force caused by excessive drum ovality or disc runout. See ANNEX 1 7.4 Related Aspects for more detail.

Note: If the test is to be conducted from the drivers seat then an additional display must be provided that is clearly visible from that position.

d. have the means to display brake force values over two ranges;

i) low range - max brake force value in the range 600 to 800 kgf
ii) high range - max brake force value in the range 3500 to 5000 kgf

e. be marked with graduations of not greater than;

i) 10 kgf from zero up to and including 240 kgf.
ii) 20 kgf from 240 kgf up to and including 800 kgf.
iii) 50 kgf from 800 kgf and above.

Note: If a digital display is included then a relaxed requirement can be applied to the analogue scale provided that the digital scale exceeds the above requirements and the analogue scale still permits satisfactory evaluation of drum ovality or disc runout.

h. indicate individually for each roller set when a wheel lock occurs.

g. retain the maximum brake force values until either the indication is manually reset or the rollers are re-started.

2.5 User Controls

Note: AUTOMATIC operation of a RBT is NOT permitted for Statutory MOT testing.

The user controls shall be;

a. manually operated.

b. suitably identified in English or with acceptable symbols.

c. capable of starting the roller sets independently or simultaneously.

d. capable of stopping the roller sets.

e. capable of being operated from the vehicle driving seat by remote control.

If the remote control unit is not hard-wired:

f. suitable secondary operating controls shall be available on the console, or equivalent.

g. the unit shall be resistant to spurious signals from other sources.

h. a system shall be in place to ensure that each unit is dedicated to operate only one RBT when two or more are used in close proximity.

i. provision of safe storage shall be provided for the remote control unit when not in use.

In addition, there shall be;

j. a visual indication for the user on the display console showing;

i) when each roller set is in operation.

ii) if the RBT has a bi-directional facility, whether the roller sets are operating in ‘forward' or ‘reverse’ direction.

2.6 Brake Efficiency and Imbalance

The brake tester shall provide a printout with final test results, calculated and determined as outlined in Annex 1.

2.7 Printout

A printout should be provided which includes all the information shown in the example given in Appendix 17, except for the VOSA logo should be omitted.

The layout of the top section of the printout giving the vehicle details should ideally resemble the example but alternative layouts are permitted.

The layout of the test results section should be exactly as the example.

The layout of the 'Unsatisfactory Wheel Performance' section of the printout should ideally resemble the example but alternative layouts are permitted.

Additional information such as the manufacturer's logo and/or the site owners logo may be included if desired

3. CALIBRATION

A means of calibrating the brake force shall be available and the RBT display shall be capable of showing negative numbers close to zero.

The applicant shall provide an assurance that a system is in place to ensure all of its calibration devices used for the subject RBT are checked and certified by an accredited organisation on a regular basis.

Note 1: In line with a move toward ISO17025 style facility management it is likely in the future that provision will be made whereby the required frequency of calibration will be monitored and adjusted depending on the ability of the RBT to maintain the accuracy. This may mean increased or decreased calibration frequencies depending on the accuracy of the RBT over time.
Note 2: See 4d

3.1 Brake Force Measurement

The calibration equipment shall;

a. be capable of checking brake force accuracy at the following values;

low range: 0, 100, 200, 400 and 600/800 kgf
high range: 0, 1200/1500, 2000/2500 and 3500/4000 kgf

Note 1: If the brake force measurement is displayed on traditional dials, the accuracy of the calibration shall be assessed via the dials and not from any secondary means.
Note 2: If the brake force measurement is displayed digitally, the accuracy of the brake force measurement shall be judged against the digital values.

b. have a method and operational accuracy that is traceable to a national physical standard.

c. be certified by a UKAS accredited laboratory, or an equivalent European laboratory, that the whole calibration device is traceable to a national physical standard.

Note 1: All component parts of the calibration device, including any weights, shall be individually marked with an identity number to enable all parts to be kept together as a set. The certificate shall relate to the set and each calibration device produced shall require its own certificate.

Note 2: If the certificate or any other relevant document produced for the calibration device is not in English, the applicant shall make available a translation into English.

When the static calibration has been completed, to assess the level of torque required to rotate the RBT drive train mechanism, including any unexpected cause of increased friction such as a failing roller bearing, the following test shall be carried out:

With the RBT in 'calibration mode' and with NO vehicle in the rollers the rollers shall be rotated and the brake force displayed shall not exceed: **50 kgf**

3.2 Accuracy

The RBT brake force readings shall be accurate to within;

+/- 3 kgf of the true value from zero up to and including 100 kgf.

+/- 3 % of the true value for all readings above 100 kgf.

The RBT brake force calibration device shall be accurate to within:

+/- 0.3 kgf of the true value from zero up to and including 100 kgf.

+/- 0.3% of the true value for all readings above 100 kgf.

Note: Best practice for maintenance and calibration recommends the error level should be maintained at less than 3% and reset to as close to Zero as possible if above 1% error at time of calibration.

3.2.1 Weighing Facility

The RBT imposed weight readings shall be accurate to within;

+/- 3% of the true value between 200kg and 11600kg.

4. INSTRUCTION MANUAL

A comprehensive Instruction Manual shall be supplied with each RBT.

The Instruction Manual shall;

a. be written in English.

b. explain how to operate the RBT, including the function of each control, and how to interpret the results.

c. detail how to use the RBT to carry out a brake performance test and make reference to the need to follow the brake test procedures detailed in the latest version of the relevant MOT Inspection Manual.

d. detail the procedure for calibrating the RBT in sufficient detail to allow 3rd party calibration.

5. IDENTIFICATION

The RBT shall be marked with a durable identification on the exterior of the control console, or equivalent, showing the make, model and serial number.

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ANNEX 1 Computer Control System Requirements

Abbreviations used:

CCS	Computer Control Software	MOT	Ministry of Transport
Dft	Department for Transport (formerly Dtp)	PCLG	Private Cars & Light Goods
DGTW	Design Gross Train Weight	PSV	Public Service Vehicle
DGVW	Design Gross Vehicle Weight	RBT	Roller Brake Tester
Dtp	Department of Transport (formerly MOT)	SVA	Single Vehicle Approval
FWA	Front Wheel Allowance	TAW	Total Axle Weight
GB	Great Britain	TW	Table/Test (Chart) Weight
GTW	Design Gross Train Weight	UK	United Kingdom
GV	Goods Vehicle	ULTAST	Unladen Tri-Axle Semi-Trailer
GVW	Design Gross Vehicle Weight	ULW	Unladen Weight
HGV	Heavy Goods Vehicle	VI	Vehicle Inspectorate
LGV	Light Goods Vehicles	VLT	Van Leeuwen Test Systems B.V. - Etten-Leur, Holland or V L Test Systems Ltd, Buckingham, UK
LSV	Load Sensing Valve	VOSA	Vehicle & Operator Services Agency (formerly VI)
LW	Laden Weight (PSV's)	MAM	

1. INTRODUCTION

This document describes the construction of the brake master database files and the principles of the associated computer control software (CCS) developed by the Vehicle & Operator Services (VOSA), known at the time as Vehicle Inspectorate (VI), in conjunction with VL Test Systems (VLT). The CCS is used in the VOSA Roller Brake Tester (RBT) for testing all types of vehicles.

2. BACKGROUND

When the statutory annual testing of heavy goods vehicles (HGVs) and trailers was introduced in 1968 a relatively basic RBT was used. As the brake systems on HGVs were complex, compared to cars, brake data cards were printed to give the tester all the information required to test the vehicle correctly and a set of these cards was available with every RBT used by VI. An example of several different brake data cards is shown in Appendix 1. With the card system it was necessary for the tester to select the correct card, read it, understand it, test the vehicle accordingly and make all the correct calculations at the end of the test. This was a difficult task on many vehicles and the result was an inconsistent standard of test with the possibility of an incorrect test result.

The card system was based on the use of a unique Department of Transport (Dtp) number to identify the braking system used on a vehicle and this Dtp number appears on the individual vehicle plate. As new vehicles were introduced, new cards were added to the system and by 1982/3, when type approval of vehicles was introduced, the number of cards held at each RBT was approaching 3000. A new start was made for type approved vehicles starting at Dtp number 3000. New brake systems continued to be introduced and today there are around 6000 different Dtp numbers for new vehicles and over 8000 when modified vehicles are included.

In 1986 VOSA commenced development of a new RBT which included a computer to hold the brake master database and, using the CCS, control the test, guiding the tester through the correct test for each vehicle. When the new computer controlled RBT was being developed, the principles of the software were extended so that a computer controlled test was possible on all vehicles and to achieve this additional files were created to deal with semi-trailers.

When the information contained on the cards was transferred to a computer database it was essential that no key information was omitted. Also, it was decided at the outset that although some vehicle types were very old and there may be only a small number of some obscure vehicle types, the computer system would be designed to cope with all known vehicles registered in GB.

3. COMPUTER CONTROL SYSTEM

The initial screen of the CCS enables the tester to select from three different vehicle types, and more could be added if required. The current version of the CCS provides the following options:

HGV	Tested by VOSA staff only
PSV	
Trailers	

After the tester has selected the vehicle type to be tested, the option of a full test, a re-test or a voluntary brake test can be made. The CCS will then guide the tester through the correct procedure for that particular vehicle to ensure that an accurate brake test is carried out to a consistent standard. All brake force calculations are done by the CCS but the tester has to observe the dials to assess the condition of the brake components. The vehicles which can be tested only by VOSA staff have relatively complicated brake systems compared to the majority of those within the MOT scheme, and to enable the CCS to work all the 'VOSA only Tested' vehicles have an identity number which is the key to the CCS.

For HGV and Trailers, the basic information is contained in the brake master database files supplied by VI. A detailed description of all the files which make up the brake master database is given in Sections 4 & 5. A meaningful numbering system, whereby all the information required is contained within the number, is used for testing Public Service Vehicles (PSVs), no separate files are necessary. No vehicle identity numbers or separate files are used for vehicles tested under the MOT scheme.

For any vehicle for which no identity number is available, the CCS will produce questions to be answered by the tester. When this has been completed the CCS will guide the tester through the test in the normal way. This system is referred to as 'semi-automatic' mode (see Section 11.1).

3.1 Brake Master Database Files

The brake master database is supplied on floppy disk and, along with a number of separate associated files, is presented in ASCII (DOS) text format. All files were compiled using the Micropro Datastar program and in all files the fields are comma delimited. Copies of the brake master database supplied prior to October 1998 would have a total of twelve files but one file (secbkpos.dta) was not used in VI's CCS and has been removed from post-October 1998 versions. The list below, in alphabetical order, gives the name of each file supplied and the types of vehicle to which it is applicable:brakrout.dta	Applicable only to the testing of HGV's	Brake file set
braktype.dta		
master.dta		
secbkpos.dta		

splitrou.dta		
vehmake.dta		
1atrl.dta	Applicable only to the testing of semi trailers	
2atrl.dta		
3atrl.dta		
4atrl.dta		
vehtype.dta	Applicable to all vehicle types	
version.dta	Identifies the release date of the brake file set	

A full description of all HGV related files is given in Section 4, for all files related to semi-trailers in Section 5.

4. HEAVY GOODS VEHICLES

A full description of the brake master database files applicable to HGVs (as listed in Section 3.1) is given below.

4.1 Description of MASTER.DTA file

Appendix 2 shows the form definition used to construct the master.dta file, which is applicable only to HGVs. At the outset, to ensure all information contained on the brake data cards was included, 34 fields were defined on the form but not all are now used by the VOSA CCS. A description of each field is given below. Appendix 3 shows a printout of various sections of the master.dta file, this file may grow as new vehicles are type approved.

Field 1 - Dtp Number

The Dtp number is contained in Field 1 which has space for six alpha/numeric characters. The Dtp number, which is *almost* identical to that on the brake data cards, is the key to the whole process as it leads to the identification of the complete braking system on a particular vehicle. For vehicles manufactured prior to the introduction of type approval, the number would be either a four character numeric or a four character numeric followed by a single alpha character (A to E). When type approval was introduced it was decided to re-start the Dtp numbers at 3000 and these are all four character numeric.

In addition to the numbers used for new vehicle types are numbers used when a vehicle has been modified after manufacture; these numbers are identified by a ‘B’ prefix and are discussed in Section 4.2 . Also there are further suffixes to identify variations which occur with any Dtp number. These suffixes, which are used with both pre and post type approval and ‘B’ prefix Dtp numbers; are discussed in Section 4.3.

Field 2 - Vehicle Make

Field 2 contains a three character numeric code used to identify the vehicle make. The code is used in conjunction with the vehicle make file (vehmake.dta) described in section 4.4

Field 3 - Vehicle Type

Field 3 contains a two-character alpha/numeric code used to identify the vehicle type. The code is used in conjunction with the vehicle type file (vehtype.dta) described in Section 4.5. The vehicle type file contains codes for all vehicle types, see Appendix 5 for details.

Field 4 - Brake Routine Number

Field 4 contains a three-character alpha/numeric code used to identify the configuration of all three designated braking systems on the vehicle. The code is used in conjunction with the brake routine file (brakrout.dta), described in Section 4.6.

Field 5 - Pre / Prior / Post 1968 Options

Field 5 is a single character alpha field used to identify whether there is an option to test a vehicle under the Pre-1968 or Prior-1968 performance requirements, this field is not applicable to type approved vehicles. This field will either contain a 'Y' or be blank, if blank and the Dtp number is less than 3000, the vehicle will be tested as a Post-1968 vehicle. If however it contains a 'Y' the software will ask a question to establish whether the vehicle should be tested as a Pre-1968, Prior-1968 or Post 1968 vehicle; the answer to this question can come only from the vehicle tester. Section 7 discusses brake performance requirements for HGVs and, with reference to the 1968 period, there are different performance requirements according to the age of vehicle.

Field 6 - Split Routines

Field 6 contains a four-character alpha/numeric code which identifies the format of the split routine where a split service system is the designated secondary brake. The code is used in conjunction with the split routine file (splitrou.dta), described in Section 4.7.

Field 7 - Second Front Axle Steered

Field 7 is a single character alpha field used to identify whether a vehicle has one or two **front** steered axles. This field either contains a 'Y' or is blank; if blank the vehicle has only one front steered axle. This information is used when calculating the front wheel allowance (FWA) described in Section 7.4.7. Any steered axle that is not at the front of the vehicle has no effect on the FWA. This field also has an effect upon which wheels are assessed for ovality; if the field is blank the wheels of the second steered axle are not assessed.

Field 8 - Brake Distribution (Service)

Field 8 is a two character numeric field used to provide the static brake distribution for the service brake. The brake distribution figure is used in the calculation of the FWA, which is used in the brake performance calculation when a front wheel locks during the brake test. The brake distribution, shown as a percentage, refers to the design static brake performance expected from the brake components used on the front axle(s) compared to the brake components used on the rear axles(s). Examples of different vehicles are given below:

a) A two axle vehicle with identical brake components on both axles would be expected to provide the same static brake force from each axle thus 50% of the total brake force would be provided by the front axle and the entry for Field 8 would be ‘50’.

b) A three axle vehicle with a single front axle and identical brake components on all axles would be expected to provide the same static brake force from each axle thus 33% of the total brake force would be provided by the front axle and the entry for Field 8 would be ‘33’.

c) A three axle vehicle with twin steered front axles and identical brake components on all axles would be expected to provide the same static brake force from each axle thus 33% of the total brake force would be provided by each of the front axles and in this case the entry for Field 8 would be ‘66’.

See section 7.4.7 for explanation of usage.

Field 9 - Brake Distribution (Secondary)

Field 9 is a two character numeric field used to provide the static brake distribution for the secondary brake system. The figure, which is derived in the same way as for Field 8, is used in the calculation of the FWA when testing the secondary brake system. However, when the secondary brake works only on the front axle 100% of the secondary brake performance is required from the front axle and ‘100’ should be found in Field 9 but as only two characters are available ‘99’ is entered which should always be read as 100.

Field 10 - Transmission Brake

Field 10 is a single character alpha field used to identify when a vehicle is fitted with a transmission secondary and/or parking brake. Field 10 contains a ‘Y’ if the vehicle has a transmission brake and is blank if the vehicle does not. If the vehicle does have a transmission brake, the procedure described in Section 7.3.2 should be followed.

Field 11 - Secondary Brake on Tractor Only

Field 11 is a single character alpha field used to identify a tractor unit with a secondary brake that operates only on the tractor unit. This field contains a ‘Y’ if the tractor unit does not provide secondary braking to a trailer. If blank the tractor unit does provide secondary braking to a trailer, and the secondary brake performance must be assessed against the GTW and not the GVW. This condition does not occur on type approved vehicles.

Field 12 - Design Gross Vehicle Weight

Field 12 is a four character numeric field used to provide the maximum GVW for the vehicle group. The number given is in the form GVW/10 kg, for example, 7500 kg would be entered as ‘0750', with leading zero, and 17000 kg would be entered as ‘1700'. GVW is used in various brake calculations.

Field 13 - Design Gross Train Weight

Field 13 is a four character numeric field used to provide the maximum GTW for the

vehicle. The number given is in the form GTW/10 kg, for example, 9950 kg would be entered as ‘0995', with leading zero, and 37000 kg would be entered as ‘3700'. GTW is used in various brake calculations.

Field 14 - Design Weight Axle 1

Field 14 is a three character numeric field used to provide the maximum design axle weight for the first axle. The number given is in the form axle-weight/10 kg. For example, 7500 kg would be entered as ‘750'. The axle weight is used in various brake calculations.

Field 15 - Design Weight Axle 2

Field 15 is a four character numeric field used to provide the maximum design axle weight for the second axle. The number given is in the form axle-weight/10 kg. For example, 7500 kg would be entered as ‘0750', with leading zero, and 10000 kg would be entered as ‘1000'. The axle weight is used in various brake calculations.

Field 16 - Design Weight Axle 3

Field 16 is a four character numeric field used to provide the maximum design axle weight for the third axle. Format and use details as for Field 15 .

Field 17 - Design Weight Axle 4

Field 17 is a four character numeric field used to provide the maximum design axle weight for the fourth axle. Format and use details as for Field 15 .

Field 18 - Design Weight Axle 5

Field 18 is a four character numeric field used to provide the maximum design axle weight for the fifth axle. Format and use details as for Field 15 . Although five axle rigids are not permitted on roads in GB at present, they do occur in Europe and this field has been included in case it is needed in the future.

Fields 19 to 21 - No longer used.

Field 22 - Method of Operation (Service)

Field 22 is a two character numeric code used to indicate the method of operation of the service brake system. The code is used in conjunction with the brake type file (braktype.dta), described in Section 4.8 .

Field 23 - Method of Operation (Secondary)

Field 23 is a two character numeric code used to indicate the method of operation of the **designated** secondary brake system. The code is used in conjunction with the brake type file (braktype.dta), described in Section 4.8.

Field 24 - Method of Operation (Park)

Field 24 is a two character numeric code used to indicate the method of operation of the park brake system. The code is used in conjunction with the brake type file (braktype.dta), described in Section 4.8 .

Field 25 - No **longer used.**

Field 26 - Load Sensing Valve Fitted

Field 26 is a single character alpha field used to identify when a load sensing valve (LSV) is fitted, contains a “Y” if the vehicle is known to have an LSV fitted, otherwise it is left blank.

Field 27 - Load Sensing Valve Option

Field 27 is a single character alpha field used to identify if an LSV is an optional fitting, contains a “Y” if the option is available to have an LSV fitted and is left blank if either no option is available or when a ‘Y’ has been entered in Field 26.

Fields 28 to 32 - Brake Modulation

Fields 28 to 32 are single character alpha fields used to identify axles upon which the brake line pressure is modulated and hence would appear to provide little braking effort when not fully laden. Brake modulation is most common on the second axle of modern three axle tractor units. However, even when a tractor unit is presented fully laden, maximum brake performance is unlikely to be achievable on the modulated axle as the system is deigned to take account of the dynamic weight transfer of the semi-trailer during braking. Special rules have been issued to take account of assessment of axles with modulated braking, see Section 7.4.9.

Field 33 - No longer used.

Field 34 - Double Drive with No Third Differential

Field 34 is a single character alpha field used to identify when the vehicle has a double drive with no third differential. Field 34 contains a Y if the vehicle is a double drive with no interposed third differential; otherwise the field is left blank. To avoid serious damage, the correct procedure must be used when testing a vehicle without a third differential, see Section 7.3.3.

4.2 Modified Vehicles - B Prefix

Some vehicles are modified after manufacture, to vary their carrying capacity for example. Where the modification results in alterations to the braking requirements the vehicle will require a revised Dtp number, if there is no matching entry in the database a number with a ‘B’ prefix will be issued, see Appendix 3, Page 3.

4.3 Dtp Number Suffixes

With Dtp numbers of less than 3000 (pre-type approval), suffixes A to E are used to identify different brake characteristics within the same basic vehicle. These suffixes (A to E) actually form a part of the Dtp number and are shown on the vehicle plate. However, the database contains further suffixes, which are used with all types of HGV Dtp numbers, including ‘B’ prefix numbers, these suffixes (‘F’ onwards) do not appear on the vehicle plate; they appear only in the master.dta file and on the brake test report printout.

These additional suffixes indicate an option of some kind related to the brake system of the vehicle that can be identified only by tester observation. For example, a vehicle may be type approved with the option of a parking brake operating on either axle 1 or axle 2. In this situation a correct brake test can only be carried out when the CCS

knows on which axle the parking brake operates. Thus the additional suffix enables the CCS to ask the question at an early stage in the test so that an uninterrupted brake test can then be carried out. The use of these suffixes can be seen in all three examples of the master.dta file shown in Appendix 3, Pages 1 to 3

The list below shows the question that will be asked when a particular suffix is used:

F	*Not used at present*
G	Drum brakes or disk brakes?
H	Two or three position hand control fitted?
I	Parking brake on Axles 1 & 4, 2 & 4, or 2 & 3?
J	Type 24 or Twinstop 12/30 actuators fitted on front axle?
K	Parking brake on Axle 1?
L	Secondary & parking brakes on Axle 1?
M	Parking brake on Axle 2?
N	Secondary & parking brakes on Axle 3?
O	Parking brake on Axles 1 & 2, 1 & 3, or 2 only?
P	Secondary & parking brakes on Axle 4?
Q	*Not used at present*
R	*Not used at present*
S	Used as the second alternative when options are available
T	Used as the third option when option I is used
U	Used as the third option when option O is used
V to Z	*Not used at present*

4.4 Description of VEHMAKE.DTA File

Each entry of the vehmake.dta file (vehicle make) consists of two fields.

Field 1 contains a three character numeric code, as used in Field 2 of the master.dta file.

Field 2 contains the make of the vehicle in full, in alpha characters.

A printout of part of the vehmake.dta file is shown in Appendix 4. The file will grow as new vehicle makes are presented for type approval or when an existing vehicle is marketed under a new name.

4.5 Description of VEHTYPE.DTA File

Each entry of the vehtype.dta file (vehicle type) consists of two fields.

Field 1 contains a two character alpha/numeric code, as used in Field 3 of the master.dta file.

Field 2 contains a description of the vehicle type in alpha/numeric characters.

A printout of the whole vehtype.dta file is shown in Appendix 5. The file will grow only when a new type of vehicle is introduced for testing, very rarely.

4.6 Description of BRAKROUT.DTA File

Each entry of the brakrout.dta file (brake routine) consists of four fields.

Field 1 contains a three character alpha/numeric code, as used in Field 4 of the master.dta file. The meaning of the code is described below:

First character:	identifies the axles on which the service brake system operates
Second character:	identifies the secondary brake system, either split or axle details
Third character:	identifies the axles on which the parking brake system operates

Each character has the following meaning:

Character		Detail
0 (Zero)	=	Split system (used only for second character)
1	=	Axle 1
2	=	Axle 2
3	=	Axles 1 + 2
4	=	Axle 3
5	=	Axles 1 + 3
6	=	Axles 2 + 3
7	=	Axles 1 + 2 + 3
8	=	Axle 4
9	=	Axles 1 + 4
A	=	Axles 2 + 4
B	=	Axles 1 + 2 + 4
C	=	Axles 3 + 4
D	=	Axles 1 + 3 + 4
E	=	Axles 2 + 3 + 4
F	=	Axles 1 + 2 + 3 + 4

For example, a brake routine code of 754 would have the following meaning:

First character	7	service brake operates on axles 1, 2 and 3
Second character	5	secondary brake operates on axles 1 and 3
Third character	4	parking brake operates on axle 3 only

Field 2 contains details, as shown above, of the axles on which the service brake operates.

Field 3 contains either details of the axles on which the nominated/designated secondary brake operates, as shown above, or the word SPLIT. The word SPLIT indicates that the vehicle has a split service braking system rather than a separate secondary system. Details of the split braking system are held in splitrou.dta described in Section 4.7.

Field 4 contains details, as shown above, of the axles on which the parking brake operates.

A printout of the whole file is shown in Appendix 6. The brake routine file will increase in size in the future if five+ or different axle configuration vehicles are introduced in GB.

4.7 Description of SPLITROU.DTA File

Each entry of the splitrou.dta file (split routine) consists of two fields.

Field 1 contains a four character alpha/numeric code, as used in Field 6 of the master.dta file.

Field 2 contains a description of the split routine, as shown below:

Code	Type	Split A	Split B
2-axle vehicles			
1100		[1] only	
1122	Front/Rear	[1]	[2]
1133		[0.55 x 1]	[(0.45 x 1)+2]
1221	Diagonal	[n/s1 + o/s2]	[o/s1 + n/s2]
3113	'L' split	[(0.5 x 1) + n/s2]	[(0.5 x 1) + o/s2]
3333	Duplicate	[1 + 2]	[1 + 2]
3-axle vehicles			
1166	Front/Rear	[1]	[2 + 3]
1177		[0.55 x 1]	[(0.45 x 1) + 2 + 3]
3146		[1 + n/s2]	[3 + o/s2]
3344		[1 + 2]	[3]
3355		[1 + 2]	[1 + 3]
3366		[1 + 2]	[2 + 3]
3377		[1 + 2]	[1 + 2 + 3]
5522	Inner/Outer	[1 + 3]	[2]
5566		[1 + 3]	[2 + 3]
5577		[1 + 3]	[1 + 2 + 3]
7337		[1 + 2 + n/s3]	[1 + 2 + o/s3]
7777	Duplicate	[1 + 2 + 3]	[1 + 2 + 3]
4-axle vehicles			
33CC	Front/Rear	[1 + 2]	[3 + 4]
55AA		[1 + 3]	[2 + 4]
9966	Inner/Outer	[1 + 4]	[2 + 3]
FFFF	Duplicate	[1 + 2 + 3 + 4]	[1 + 2 + 3 +4]

The contents of the whole file is shown above, the file may increase in the future if a new form of split system is introduced.

4.8 Description of BRAKTYPE.DTA File

Each entry of the braktype.dta file (method of brake operation) consists of two fields.

Field 1 contains a two character numeric code, as used in Fields 22, 23 & 24 of the master.dta file.

Field 2 contains a description of the method of operation of the brake system as shown below:

Field 1	Field 2
01	Full mechanical
02	Air assisted mechanical
03	Full hydraulic
04	Vacuum assisted hydraulic
05	Air assisted hydraulic
06	Full vacuum
07	Full air
08	Power hydraulic
09	Lock actuator

10	Full spring
11	Full electric
12	Full air and Spring
13	Full air and Air assisted hydraulic
14	Vacuum or Air assisted hydraulic (option)
15	Vacuum and/or Hydraulic assisted mechanical (option)
16	Air assisted hydraulic or full air (option)

The contents of the whole file is shown above, the file may increase in the future if a new form of braking system is introduced.

4.9 Description of VERSION.DTA File

The version.dta file contains one entry field which gives the version number of the brake master database supplied. An example of the entry is:

V986.0 or 1003.0

The above version numbers indicate the brake master database supplied was the first issue compiled in June 1998 and October 2003.

5. TRAILERS

There are two basic types of trailer; a draw-bar trailer and a semi-trailer. Each type of trailer may be single or multi-axle, and draw-bar trailers can be either a full draw-bar or a centre-axle draw-bar. Appendix 9 contains a schematic diagram showing each type of trailer covered by this document.

5.1 Trailer Numbering System

A six-character reference number is used to identify the details required to carry out a brake test on any type of trailer. The Dtp trailer brake reference number, which must not be confused with the unique trailer identity number, is constructed as follows: entered as ABCDEF

A		**B**	**C**	**D**		**E**		**F**

Character A

Character A is numeric and used to identify the type of trailer:

Character A	Trailer Type
1	1 axle semi-trailer
2	2 axle semi-trailer
3	3 axle semi-trailer
4	4 axle semi-trailer
5	1 axle centre-axle draw-bar trailer
6	2 axle centre-axle draw-bar trailer
7	3 axle centre-axle draw-bar trailer
8	2 axle full draw-bar trailer

9	3 axle full draw-bar trailer
0	4 axle full draw-bar trailer

Characters B, C & D

Characters B, C & D are numeric and used to identify the GVW of the trailer but the construction of the number is different for draw-bar trailers and semi-trailers.

a) **Draw-Bar Trailers**

The weight used when brake testing draw-bar trailers, both full draw-bar and centre-axle draw-bar, is the GVW. The GVW is entered in the character B, C & D positions as follows:

i) The GVW is entered in the form GVW/100, rounded up to the next whole number if necessary.

ii) When the GVW is less than 10000 kg the sum will result in a two-character number and in these cases a leading zero must be used. For example, a draw-bar trailer with a GVW of 9750 kg would be shown as follows:

9750/100 = 98 (rounded up) Number entered = 098

iii) When, for example, the GVW is 32750 kg, the entry would be as follows:

32750/100 = 328 (rounded up) Number entered = 328

Thus the number entered in the character B, C & D positions for draw-bar trailers is a meaningful number.

b) **Semi-Trailers**

Semi-trailers have to be treated in a different way to draw-bar trailers as the GVW of semi-trailers includes the total weight on the axles plus the imposed weight on the king-pin of the tractor unit. When a semi-trailer is connected to a tractor unit, the tractor unit would have sufficient braking from its service brake to cope with the imposed weight on the kingpin and the semi-trailer service brake would need to take account only of the total weight on the axles. However, when a fully laden semi-trailer is parked without the tractor unit, the parking brake must control the entire GVW. It was not possible to present all this information in three characters so, for semi-trailers only, the number entered in characters B, C & D is not a meaningful number, it is used only as a reference to access the additional files;

1atrl.dta
2atrl.dta
3atrl.dta
4atrl.dta

supplied with the brake master database. All axle weight and GVW information required to test a semi-trailer is contained in the additional files, a description of which is given in Sections 5.2 to 5.5 .

The additional semi-trailer files are active files in that a printout of the files is used when

a semi-trailer is first presented for testing, which is when the trailer Dtp number is created and allocated to the trailer. If the particular combination of axle weights and GVW for the trailer is not available in the list, a new code will be created and the information added to the relevant file for future use. All new additions will be included automatically when the semi-trailer files are next supplied. It is important therefore, that updates of these files are obtained and used if MOT testing is being carried out.

Character E

Character E is alpha/numeric and identifies the axles on which the parking brake operates and takes the same form, with the exception of “0 (Zero)”, as for HGVs, see section 4.6.

Character F

Character F is numeric and identifies whether load sensing valves and/or anti-lock brakes are fitted, whether the trailer is fitted with brakes to a type approved standard and whether it has Electronic Braking System (EBS). The meaning of character F is as below:

Character F	Load Sensing	Anti-Lock	Type Approved	EBS
0	-	-	-	-
1	-	-	Y	-
2	-	Y	-	-
3	-	Y	Y	-
4	Y	-	-	-
5	Y	-	Y	-
6	Y	Y	-	-
7	Y	Y	Y	-
8	-	-	-	Y

A trailer with a type approved braking system will be tested according to the performance requirements specified in Section 8. If the brake system is not type approved then the RBT CCS will ask a question, similar to that described in Section 4.1 (Field 5), to establish whether the trailer should be tested as a Pre-1968, Prior-1968 or Post-1968 vehicle.

5.2 Description of 1ATRL.DTA File

Each entry of the 1atrl.dta file consists of five fields, all numeric but Field 3 is blank.

Field 1 a five character numeric field, which gives the GVW of the trailer. To restrict the total number of different entries GVWs are grouped in ranges of 250 kg. For example, all trailers with a GVW in the range 16250 kg to 16499 kg would be shown with an entry of ‘16250' (rounded down). GVWs of less than 10000 kg are shown without leading zeroes.

Field 2 a five character numeric field, which gives the design axle weight of the single axle. Again, to restrict the total number of different entries, axle weights have been grouped in ranges of 100 kg. For example, all trailers with an axle weight in the range 6100 kg to 6199 kg would be shown with an entry of ‘6100' (rounded down). Leading zeroes are not shown.

Field 3 is blank.

Field 4 a five character numeric field which gives the TAW of the bogie which in the case of a single axle semi-trailer is the same as Field 2. Leading zeroes are not shown.

Field 5 a three character numeric code field which relates to that used in Characters B, C & D of the Dtp Trailer Brake Reference Number. Thus by use of this code, details of the TAW and GVW of the semi-trailer can be obtained.

A printout of part of the 1atrl.dta file, sorted on GVW ascending, is shown in Appendix 10.

5.3 Description of 2, 3 & 4ATRL.DTA Files

Each entry of the ?atrl.dta files consist of nine fields, all numeric but varying fields are blank.

Field 1 as for 1atrl.dta file, see section 5.2.

Field 2 as for 1atrl.dta file, see section 5.2.

Fields 3 to 5 are five character numeric fields which gives the design axle weight of the second, third & fourth axles. Format details as for Field 2 .

Fields 6 & 7 are blank.

Field 8 a five character numeric field, which gives the total axle weight of the bogie. This value is simply the addition of Fields 2 to 5, and format details are the same as Field 2.

Field 9 a three character numeric code field which relates to that used in Characters B, C & D of the Dtp Trailer Brake Reference Number. Thus by use of this code, details of the axle weights and GVW of the semi-trailer can be obtained.

A printout of part of the 2, 3 & 4atrl.dta files is shown in Appendix 10.

5.4 Other Trailers

Although semi-trailers with more than four axles, and other multi-axle trailers not included in the above descriptions, are used in GB, they are designed for special purposes and are not used for normal operations. The testing scheme does not currently apply to special types vehicles but if any such trailers are used for normal operations they would be tested without the use of the RBT CCS, i.e. in Manual Mode.

6. BUSES AND COACHES

Buses and coaches fall into two categories; Class V and Class VI. For Class V vehicles please see the relevant specification.

6.1 Class VI

These vehicles consist of all buses and coaches, with more than eight passenger seats, which carry fare-paying passengers; these are public service vehicles (PSVs). Class VI vehicles are tested in accordance with the Public Service Vehicle Inspection Manual by VOSA staff only, in either VOSA goods vehicle testing stations or VOSA Designated Premises. Section 6.2 is applicable only to testing Class VI vehicles.

6.2 Public Service Vehicle (Class VI) Numbering System

A	**B**	**C**		**D**		**E**		**F**

Characters A, B & C

Characters A, B & C are numeric and used to identify either the laden weight or the GVW of the PSV.

The weight is entered in the form: Weight/100 kg

If the resulting sum is only two characters, a leading zero is added. For example:

A PSV with a GVW of 7500 kg will be calculated as 7500/100 and entered as ‘075'.

Character D

Character D contains an alpha/numeric code which is used to identify whether a split braking system is the designated secondary system and, if it is, details of the system. Each character used has the following meaning:

Character	Vehicle	Secondary Brake System	*Equivalent HGV Code*
1	2 axle	No split (separate secondary system)	
2	2 axle	Front/Rear split	*1122*
3	2 axle	‘L’ split	*3113*
4	2 axle	Duplicated system	*3333*
5	2 axle	Diagonal split	*1221*
6	2 axle	Axles [1] & [1 + 2]	*1133*
7	3 axle	No split (separate secondary system)	
8	3 axle	Axles [1 + 2] & [1 + 3]	*3355*
9	3 axle	Axles [1 + 3] & [2 + 3]	*5566*
A	3 axle	Axles [1] & [1 + 2 + 3]	*1177*
B	3 axle	Axles [1] & [2 + 3]	*1166*
C	3 axle	Axles [1 + 2] & [3]	*3344*
D	3 axle	Axles [1 + 3] & [2]	*5522*
E	3 axle	Axles [1 + 2] & [1 + 2 + 3]	*3377*
F	3 axle	Axles [1 + 2] & [2 + 3]	*3366*

G	3 axle	Duplicated system	*7777*

Reference to Section 4.7 will provide a detailed description of the names used for each of the split braking systems shown in the table above and, with the exception of character “6” - see section 9.2, shows how to calculate each half of all the split systems. To aid that process, the relevant HGV Codes have been shown in the table above.

Character E

Character E contains a numeric code that is used to identify if or where a separate nominated/designated secondary brake system is fitted. Each character used has the same meaning as for HGVs, see section 4.6.

Character F

Character F contains an alpha/numeric code that is used to identify on which axles the parking brake is fitted. Each character used has the same meaning as for HGVs, with the exception of character “F” which indicates that a Transmission brake is fitted, see section 4.6.

7. BRAKE PERFORMANCE CALCULATIONS - HGV

The brake performance requirements for vehicles tested under the Heavy Goods Vehicle testing scheme are specified in the Goods Vehicles (Plating and Testing) Regulations 1988, as amended. This section explains how the brake performance for each braking system is calculated for HGVs. The vehicles to be tested as a HGV are specified in the Regulations but in general terms they are any motorised load-carrying vehicle with a GVW greater than 3500kg. Appendix 11 shows the brake performance requirements for all rigid vehicles and tractor units and was correct at the time of writing this document. However, the information contained in the latest version of either the Plating and Testing Regulations or the Heavy Goods Vehicle Inspection Manual shall be regarded as the definitive requirements.

The Plating and Testing Regulations relate brake performance to GVW, and in some circumstances GTW, which will be found in the brake master database. As some elements of the brake performance test relate to presented axle weight, either a built-in weighing system or a separate (preferably electrically linked) axle weighing system is necessary with the RBT.

7.1 Service Brake

The brake performance requirements for the service brake are detailed in Appendix 11. For all vehicles other than ‘Pre-1968' vehicles, the total service brake performance requirement is:

50% x DGVW

The total service brake performance requirement for ‘Pre-1968' vehicles varies with the number of axles and whether the vehicle is a rigid or a tractor unit. It should be noted also there is no requirement for ‘Pre-1968' vehicles to have a brake on every axle.

7.2 Secondary Brake

There are basically two types of secondary brake; either a completely separate system with a hand lever in the cab, or a split service brake system whereby both halves of the split are completely independent systems operated by the single foot operated service brake pedal. The brake performance requirements for the secondary brake are detailed in Appendix 11. For the majority of vehicles, the total secondary brake performance requirement is:

25% x DGVW

The total secondary brake performance requirement for 'Pre-1968' vehicles varies with the number of axles and whether the vehicle is a rigid or a tractor unit. For 'Prior-1968' and 'Post-1968' vehicles, if the secondary brake of a tractor unit does not work on the trailer the GTW has to be used (ref. Field 11, master.dta file).

When the designated secondary brake is a split service brake system, each half of the split shall be required separately to meet the secondary brake performance requirements.

7.2.1 Optional Systems

If the designated secondary brake system does not meet the specified performance requirements, the efficiency of another brake system, which can be applied progressively, may be taken into account as an alternative. For example, if either one half of a split braking system, or a separate secondary system, failed to achieve the specified secondary brake performance requirement but another **progressively** applied brake did achieve the necessary requirements the secondary brake requirements would be deemed to have been met.

7.3 Parking Brake

The brake performance requirements for the parking brake are detailed in Appendix 11. It can be seen that there are no specific performance requirements for 'Pre-1968' or 'Prior-1968' vehicles and there are different requirements for 'Post-1968' and Type Approved vehicles.

It should be noted that for Type Approved vehicles, the criteria to be met is the greater of either:

16% x DGVW, or 12% x DGTW

7.3.1 Applied Brake Test

When testing HGVs, the parking brake system should be tested using the applied brake test method whereby the parking brake is fully applied prior to starting the RBT motors.

7.3.2 Transmission Brake

When a vehicle is fitted with a transmission brake it can only be tested by running both wheels on the axle together, in the same direction, then the brake must be applied very

carefully and to prevent the vehicle from coming out of the rollers the front axle must be chocked. Transmission brakes can be found on all classes of vehicle except trailers.

7.3.3 Multi-drive axles

Vehicles with multi-drive axles can be tested on a RBT, those with a third differential can be tested as a normal vehicle, i.e. as a single drive axle. However, if the vehicle doesn't have a third differential the vehicle has to be tested by rotating the wheels on the RBT in contra-rotation. Obviously this means that those vehicles without a third differential cannot be tested running two wheels together both in a forwards direction, a requirement for classes 4, 5 & 7.

7.4 Related Aspects

In addition to the main performance requirements there are other aspects of the brake test that need clarification to ensure that all computer controlled RBTs are operating to the same standards.

7.4.1 Bind

When a wheel starts to rotate on a RBT it is likely that a small 'brake force' will be indicated which could arise from two sources, 'drag' and 'bind'. Drag is an unavoidable effect caused by the effort placed upon the RBT motor to rotate the vehicle wheel, the drive mechanism (if applicable) and to overcome the surface friction and deflection of the vehicle tyres. Because of the tyre effect, drag will become greater as the presented weight on the axle becomes greater. Bind is the friction resulting from any contact between the braking surfaces. It is likely that the brakes will have been adjusted to ensure that there is the best chance of passing the test and there is a possibility that the adjustment may have left the braking surfaces in too close a contact. As a result a limit has been placed on the maximum 'brake force' allowed when the RBT motor is running and the vehicle brakes have yet to be applied. The limit set takes account of both drag and bind but is referred to only as 'bind'.

To pass the test for 'Bind', the indicated brake force when the RBT rollers are started shall not exceed:

4% of presented axle weight per wheel

7.4.2 Little or No Brake Effort

The Regulations state that on all Post-1968 and Type Approved vehicles every wheel shall have an effective service brake. Although the overall brake performance of a vehicle may be obtained with one wheel ineffective, a limit has been set for 'little or no brake effort'.

To pass the test for 'Little or No Brake Effort' the maximum brake force shall not be less than:

5% of presented axle weight per wheel

It can be seen in Appendix 11 that for vehicles registered before 1968 no performance requirement is specified for the parking brake but these vehicles must have a parking

brake and it shall meet the 'little or no brake effort' requirement. However, as it was not a requirement to have a brake on every wheel of Pre-1968 vehicles, where no brake is fitted to a wheel the 'little or no brake effort' rule cannot be applied.

7.4.3 Time lag

It will be seen that HGV Brake Test reports have a column for 'Time Lag', the VOSA CCS is currently not assessing this element of the test and all tests results will be "Pass". The reason for this is because at present the vehicle wheels are rotated individually and there is no pedal pressure meter in use. However if the inspector/tester has reason to do so he/she can overrule the test report.

7.4.4 Imbalance

For HGVs, PSVs and Trailers all wheels are tested individually, thus it is not possible to assess imbalance throughout the whole range of brake force. Imbalance is assessed only at the maximum brake effort achieved for each wheel on an axle. The following formula is used:

$$\text{Imbalance (\%)} = \frac{\text{Higher Brake Effort - Lower Brake Effort x 100}}{\text{Higher Brake Effort}}$$

For the service brake only a failure shall be recorded if the imbalance is:

Greater than 30%

If both wheels on an axle lock, the imbalance criterion is not applicable.

If one wheel on an axle locks, the following rules shall be applied:

a) If the brake force from the locked wheel is less than the non-locked wheel, the imbalance criteria defined above is not applicable as the locked wheel is deemed to be capable of a greater brake force.
b) If the brake force from the locked wheel is greater than the non-locked wheel, the imbalance criteria defined above shall be applied, as the non-locked wheel may be defective.

7.4.5 Ovality

Ovality is measured only on **front** steered axles.

In the CCS for HGVs and PSVs, the trigger for measuring ovality comes in at either 65% of the FWA or after 4 seconds of brake application, the latter is to deal with brakes that do not get to 65% of the FWA. The following formula is used:

$$\text{Ovality (\%)} = \frac{\text{Max Brake Force - Min Brake Force x 100}}{\text{Max Brake Force}}$$

A failure shall be recorded if, when a wheel is rotated with a steady brake pressure applied, the braking effort varies by greater than 70%.

7.4.6 Hydraulic Pressure Fall-Off

Ovality was originally checked on all axles but when the change from testing all axles to testing only front steered axles was written into the software there was a request from test station staff to re-introduce the 'ovality' check on each rear axle in certain circumstances. VOSA testing staff had observed that the ovality check provided the opportunity to assess the integrity of a hydraulic brake system. In response to the request, the 'ovality' check was re-introduced on each rear axle of any HGV or PSV that has a hydraulic element to the brake system. The entry in the master.dta file (Field 22) is used to identify when hydraulics form a part, or all, of the brake system and when the brake test report is printed out, the heading 'Fall-Off' will be shown in place of 'Ovality'. No result will be shown when the heading is 'Ovality' but a result of either 'Pass' or 'Fail' based on the ovality algorithm will be shown when the heading is 'Fall-Off'.

There is an anomaly, because the ovality algorithm is used for the 'Fall-Off' check if, by chance, the wheel does record extreme ovality it is possible for the CCS to show an invalid 'Fail' for 'Fall-Off'. However, by the time the 'Ovality' and 'Fall-Off' checks have been completed at least four wheels will have been checked and it should be possible to make an accurate assessment of the whole situation. When the driver is asked to hold the brake pressure steady for either test, if actual ovality is present the brake force will generally oscillate whereas when fall-off of hydraulic brake pressure occurs there will be little or no rise in 'brake force', it will just steadily fall. To conduct the 'Fall-Off' test properly a pressometer would have to be used.

7.4.7 Front Wheel Allowance

If a front wheel locks during a test of the service or secondary brake, either the actual value of brake force recorded or the calculated FWA value, whichever is the greater, shall be used. The FWA is calculated using the information from Fields 7, 8, 9 & 12 of the brake master database as follows:

For each front wheel that locks, the FWA (kg) is:

Service = (0.5DGVW / Number of Front Steered Wheels) x (Brake Distribution Service / 100)

Secondary = (0.25DGVW / Number of Front Steered Wheels) x (Brake Distribution Secondary / 100)

Notes: i) The value to be used for GVW is in Field 12 (x 10)
ii) Number of front steered wheels can be derived using Field 7
iii) Brake Distribution Service is in Field 8
iv) *Brake Distribution Secondary is in Field 9 (note: 99 = 100)*

7.4.8 Locked Wheels

If more than half of the wheels lock during the test of any brake system, and the related elements discussed in 7.4.1 to 7.4.5 have been met, the vehicle shall be deemed to have met the performance requirements for that system.

7.4.9 Load Sensing Valves

Hydraulically operated load simulators are available in all VOSA owned goods vehicle testing stations. Additionally, laden semi-trailers are available at a number. Some form of load simulation should be used when necessary. The VOSA RBTs will automatically call for load simulation when there is insufficient weight on an axle. However, when it is not possible to apply a load the driver may be allowed to disconnect a mechanical load sensing valve, or by-pass it if it is integrated within the air system, for the duration of the brake test.

7.4.10 Modulated Braking

On some three-axle tractor units modulated braking is applied to (usually) the second axle (ref. Fields 28 to 32 of the master.dta file). The brake line air pressure is severely limited to the modulated axle until a significant load has been applied. A laden semi-trailer will enable some brake force to be achieved but the system has been designed to take account of dynamic weight transfer and even with a normal laden semi-trailer insufficient brake force may be available to pass the test. At least 65% of the total design axle weight should be available prior to starting the brake test. To help overcome this problem, at some VOSA test stations a semi-trailer with 15 tonnes on the king pin is available for use during the test.

7.5 Modified Vehicles

All 'B' prefix vehicles (see Section 4.2) shall be tested to the Type Approval requirements.

8. BRAKE PERFORMANCE CALCULATIONS - TRAILERS

The Goods Vehicles (Plating and Testing) Regulations 1988, as amended, define which trailers shall be tested under the HGV Testing Scheme. Basically, for a trailer to be tested under the HGV Testing Scheme, it must either be a semi-trailer, converter dolly or a trailer with an unladen weight exceeding 1020 kg. The brake performance is related to the GVW and, in the case of a semi-trailer, to the total weight carried on the axle(s) alone (TAW). Appendix 12 lists the brake performance requirements for each type and all age categories. The information shown in Appendix 12 was correct at the time of writing this document but the information contained in either the Plating and Testing Regulations or the latest version of the Heavy Goods Vehicle Inspection Manual shall be regarded as the definitive requirements.

8.1 Service Brake

The brake performance requirements for the service brake are detailed in Appendix 12. Depending upon the age and type of trailer, the service brake performance requirement for semi-trailers ranges from 32% to 45% TAW. The TAW is used for semi-trailers as the imposed weight on the king-pin is catered for in the braking capacity of the tractor unit. For draw-bar trailers, the service brake performance requirement ranges from 40% to 50% GVW depending upon the age of the trailer.

8.2 Secondary Brake

There is no requirement to test the performance of the secondary brake on a trailer; a functional check is conducted at another stage of the inspection.

8.3 Parking Brake

The brake performance requirements for the parking brake are detailed in Appendix 12. It can be seen there is no performance requirement specified for the parking brake system on either Pre-1968 or Prior-1968 trailers of any type but trailers must have a parking brake and the minimum requirement for 'little or no brake effort' should be achieved. The requirement for Post-1968 and Type Approved trailers of all types is 16% GVW.

8.3.1 Applied Brake Test

When testing Trailers, the parking brake system should be tested using the applied brake test method whereby the parking brake is fully applied prior to starting the RBT motors.

8.4 Related Aspects

Some of the related aspects described in Section 7.4 are applicable also to Trailers. To save repeating the whole text, all the subjects discussed are listed below and the relevance to Trailers is shown:

Bind	Applicable to all Trailers
Little or No Brake Effort	Applicable to all Trailers
Imbalance	Applicable to all Trailers
Ovality	Not applicable to any Trailers
Hydraulic Pressure Fall-Off	Not applicable to any Trailers
Lead/Lag	Not applicable to any Trailers
Front Wheel Allowance	Applicable only to full draw-bar Trailers (see 8.4.1)
Locked Wheels	Applicable to all Trailers (however see Section 8.5)
Load Sensing Valves	Applicable to all Trailers (however see Section 8.5)
Modulated Braking	Not applicable to any Trailers

8.4.1 Front Wheel Allowance

To take account of the dynamic weight transfer that takes place when the brakes are applied on a full draw-bar trailer, a FWA shall be applied when a front steered wheel locks. The method used to calculate the FWA, which is applicable only to the service brake system, is:

Maximum Brake Force (achieved per wheel) x 1.25

The above method of calculating the FWA is applicable only to full draw-bar trailers with either one or two front steered axles (see Appendix 9); it is not applicable to any other type of trailer.

8.5 Tri-axle Semi-Trailers

A large percentage of Tri-axle semi-trailers are leased from rental companies and these companies have difficulty in presenting trailers for test in a laden condition. When a trailer is tested in the normal way, even using a load simulator, if the load sensing valve is working correctly it is likely that insufficient brake force will be achieved to pass the test, even if the brakes are in perfect working order. If the LSV is disconnected and the brake system is in very poor condition, a trailer could easily lock more than half the

wheels (and pass on locks) but that result would not be a viable assessment of the braking system. In an effort to address this problem a special procedure has been developed which deals specifically with unladen tri-axle semi-trailers (ULTASTs), it is not applicable to any other type of unladen trailer.

The basis of the revised procedure is to achieve a specified level of brake force in addition to a specified number of wheel locks for both the service and parking brake systems.

8.5.1 Rules

The rules used to assess whether the ULTAST test is applicable are:

a) The trailer must be a tri-axle semi-trailer.
b) The trailer must be totally unladen, it must carry nothing but ropes, sheets and any other items which can be regarded as a part of the equipment of the trailer. Any body type is eligible for an ULTAST test provided the trailer is unladen.
Note: A skeletal trailer designed to carry a container is regarded as unladen even when an empty container is being carried.

The ULTAST test procedure cannot be applied if:

c) The load simulator is used.
d) The load sensing valve is tied up or by-passed.

It should be noted that an ULTAST will have to meet the normal brake performance requirements for trailers, as shown in Appendix 12, if either:

i) an ULTAST test procedure is not applicable, as in c & d, or
ii) an ULTAST test is commenced and an insufficient number of wheels lock for either the service or parking brake systems.

Note: The first ULTAST test was introduced in 1989 and was developed over the next few years. However, the ULTAST test is still considered by the Department of Transport as a trial and as such the procedure has not been included in the current HGV Inspection Manual.

8.5.2 Performance Requirements

The requirements for both service and parking brake performance for an ULTAST are shown in tabular form in Appendix 13. It can be seen that the performance requirements depend upon whether the RBT has level or raised rollers and whether the trailer is fitted with air suspension. To clarify the procedure, the same information given in Appendix 13 is shown in Appendix 14 in the form of two flow charts, one dealing with testing the service brake, the other dealing with the parking brake.

Note 1: When the ULTAST test was developed, VOSA had some RBTs that had the roller sets installed level but raised about 75 mm above the floor level to increase the effective weight on the axle being tested but this did not work when air suspension was used. No RBTs with raised rollers are now used by VOSA but it is possible some may still be in use in designated premises. A raised rear roller alone is not applicable.

Note 2: The brake forces shown in the flow charts in Appendix 14 are applicable only when RBT's with level rollers installed normally are used. If an RBT with raised rollers is used the relevant brake force values shown in Appendix 13 will need to be substituted in the flow charts.

8.5.3 Variable Lock Sensing

During the development of VIs computer controlled RBTs it was noticed that when testing ULTASTs it was impossible to achieve the level of brake force required. To overcome this problem a system that allowed the lock sensing of the RBT to vary with presented axle weight was developed. The principle is based on the fact that only a small amount of slip is necessary when the axle is substantially loaded but in order to achieve a reasonable level of brake force with a lightly laden vehicle, a greater degree of slip is required. It was observed that higher levels of slip did not result in significant occurrences of tyre damage on lightly laden axles.

Note: Slip is the difference in surface speed of the RBT rollers and the tyre of the vehicle being tested. As the brake force increases, the difference in surface speed will increase and in most RBTs the motors will be switched off, and a wheel lock (or blocking) recorded, when the slip value reaches 20%. A slip of 20% occurs when the surface speed of the vehicle tyre is 80% of the surface speed of the RBT rollers.

The variable lock sensing system is dependent upon knowing the presented weight of the axle being tested. With the VOSA RBT's, axle weight measurement built into the RBT is interactive with the CCS and this allows a system of variable lock sensing to be used. The lock sensing is set to 66.6% slip for all axle weights up to 2000 kgs. The level of slip is then reduced on a linear basis to 33.3% slip when the axle weight reaches 8000 kgs. The lock sensing then remains at 33.3% for all axle weights of 8000 kgs and over. A graph of the relationship between wheel slip and axle weight is shown in Appendix 15.

Note: Although the testing of ULTAST's initiated the development of variable lock sensing, the method is now applied to all vehicles tested in VOSA test stations.

9. BRAKE PERFORMANCE CALCULATIONS - PSV's

Note: This section refers only to the testing of Class VI vehicles.

When the CCS for the VOSA RBTs was being developed, PSV's were tested exclusively by a higher grade of staff than HGV's. The test procedure, which had been in use since the testing of PSVs started in 1982, took account of the fact that the unladen weight of PSVs was readily available and that PSVs were always tested empty. A couple of tables had been created which gave the brake performance required for each brake system based upon whether any wheels lock. If no wheels lock the brake performance is judged against the laden weight, but if up to and including half the wheels lock the brake performance is judged against the unladen weight. As with other vehicles, if more than half the wheels lock the vehicle is deemed to have met the brake performance requirements.

To enable the above procedure to be used by the CCS, the weight of the PSV as presented for test (measured by the weighbridge within the RBT) is used as the unladen weight (ULW), and the laden weight (LW), or design GVW, is derived from the first three fields of the Dtp PSV brake reference number as described in Section 6.2. Articulated

PSVs are treated as one vehicle for brake tests.

The brake performance requirements are shown in Appendix 16. It can be seen that for all brake systems, the brake performance requirements depend upon whether or not a wheel locks during the brake test of that system. Thus, when testing a PSV the service brake system and one half of the secondary may be assessed against Table 1 while the other half of the secondary and the parking brake are assessed against Table 2.

Note: Since the introduction of PSV testing, including testing with the latest CCS, all PSVs are deemed to be either Pre-1968 or Post-1968 vehicles. The CCS has not been written to allow PSVs to be tested to the Post 1982 Type Approved requirements as detailed in the current PSV Inspection Manual.

9.1 Service Brake

Apart from the need to take account of whether or not a wheel locks during the test, assessment of the service brake performance is straightforward. The total brake force achieved is compared to the relevant weight (ULW or LW) to assess the overall service brake performance.

9.2 Secondary Brake

If a separate secondary brake system is fitted, apart from the need to take account of whether or not any wheel locks during the test, assessment of the secondary brake performance is straightforward. The total brake force achieved is compared to the relevant weight (ULW or LW) to assess the overall secondary brake performance.

However, when the designated secondary is a split service system there is the need to take account of whether or not a wheel locks during the test of <u>each half</u> of the split. The various split systems found on PSVs are listed under Character D of Section 6.1 and a more detailed description of how to calculate each system is shown in Section 4.7. However, it should be noted that when Character D is '6', because of the type of brake system used, a variation from the previously described method needs to be taken into account when calculating the overall secondary brake performance for PSVs.

When Character D is '6':

To assess Split 'a': Multiply the service brake effort from Axle 1 by 0.55

To assess Split 'b': Multiply the service brake effort from Axle 1 by 0.45 and add the service brake effort obtained from Axle 2

9.3 Parking Brake

Apart from the need to take account of whether or not a wheel locks during the test, assessment of the parking brake performance is straightforward. The total brake force achieved is compared to the relevant weight (ULW or LW) to achieve the overall parking brake performance.

9.3.1 Applied Brake Test

When testing PSVs, the parking brake system shall be tested using the applied brake test method whereby the parking brake is fully applied prior to starting the RBT motors.

9.4 Related Aspects

Many of the related aspects described in Section 7.4 are applicable also to PSVs. To save repeating the whole text, all the subjects discussed are listed below and the relevance to PSVs is shown:

Bind	Applicable to all PSVs
Little or No Brake Effort	Applicable to all PSVs
Imbalance	Applicable to all PSVs
Ovality	Applicable to all PSVs
Lead/Lag	As per HGVs
Hydraulic Pressure Fall-Off	Applicable to all PSVs *
Front Wheel Allowance	Applicable to all PSVs **
Locked Wheels	Applicable to all PSVs
Load Sensing Valves	Not applicable to any PSVs
Modulated Braking	Not applicable to any PSVs

* *Not as described in Section 7.4.6, see Section 9.4.1*
** *Not as described in Section 7.4.7, see Section 9.4.2*

9.4.1 Hydraulic Pressure Fall-Off

When PSVs are assessed for Fall-Off, the procedure is the same as for HGVs but the CCS will not make an assessment of the result. The tester will be asked whether or not fall-off has occurred and the answer will dictate whether a ‘Pass’ or ‘Fail’ is printed on the brake test report.

9.4.2 Front Wheel Allowance

To take account of the dynamic weight transfer that takes place when the brakes are applied on PSVs, two separate tables were derived, one utilising the Unladen/Presented weight and the other the calculated laden weight. Because the unladen weight is used for the assessment it is not necessary to apply any calculated allowance.

10. BRAKE PERFORMANCE CALCULATIONS - OTHER VEHICLE TYPES

For complete and up-to-date information, reference to the latest version of the relevant MOT Inspection Manual is necessary. For multi-drive axle vehicles see section 7.3.3.

11. Brake Test Modes

The VOSA RBTs have the ability to test in three different modes; automatic, semi-automatic and manual. Automatic is used for nearly all vehicles as the brake master database, the associated vehicle numbering systems and the intelligence of the CCS enable this to take place and ‘AUTO’ will be shown at the bottom right of the brake test report. However, occasionally a vehicle (eg. a foreign vehicle) may be presented for test without a Dtp No or a vehicle may have a Dtp No which is not yet available in the installed version of the brake master database. In these situations the vehicle is tested in semi-automatic mode and ‘SEMI’ is shown in place of ‘AUTO’. When a vehicle is tested in semi-automatic mode there will be no entry for ‘Vehicle Make’ and, for ‘Dtp No’ there will be either no entry or there will be the number entered by the tester. The RBT

will go into semi-automatic mode if the 'Dtp No' entered is either wrong or is not yet in the brake master database installed in that particular RBT.

Finally, if for any reason the CCS is not operational, the RBT can be used in a basic manual mode with no menu assistance and with only a very basic print-out of brake test results. The brake test report described in this document is applicable only when the RBT is used in either automatic or semi-automatic mode.

12. BRAKE TEST REPORT PRINTOUT

A detailed brake test report can be printed out automatically at the end of every brake test and this section explains what is meant by all the information presented on the brake test report. At present there are three options for type/class of vehicle to be tested and three options for type of test; all have been discussed in Section 3 but for convenience are repeated below:

Vehicle Types:	HGV PSV (Class VI) Trailer
Types of Test: *(applicable to each Vehicle Type)*	Full Test Re-Test Voluntary Brake Test

The basic format of the brake test report, which is used for all classes of vehicle and all types of test, is shown in Appendix 17. Italics have been used to show where some of the variations occur.

The top line of the report shows whether the brake test is a full test, a retest or a voluntary brake test. If it is a retest or a voluntary brake test, the heading will show also which brake systems have been tested. The following options can be selected:

Full Test (which will show 'Service and Secondary and Parking' in heading)
Service only
Service and Secondary
Service and Parking
Secondary only
Secondary and Parking
Parking only

The number printed at the far right of the top line (1762) is the sequential number of test on that particular RBT.

In the first block, which runs from 'Dtp Number' to '*GTW/TAW*', entries will be shown for all vehicle types in; 'Vehicle Type', 'GVTS', 'Date' and 'Time'. The 'GTW/TAW' heading will be either 'GTW' or 'TAW', depending upon class of vehicle, or no heading will be shown in that position for vehicles to which neither heading is applicable. 'GTW' is used only for HGVs and 'TAW' is used only for semi-trailers.

In the next block, which contains results on an axle basis, not all headings will contain an entry for some classes of vehicle and/or some types of test. 'Time Lag' is no longer assessed automatically but the column has been retained and the result will show 'Pass' for HGVs and PSVs but no entry for Trailers. Only two blocks of 'Axle' data have been shown but it could be up to four blocks. Also, all three brake systems have been

shown for each axle but only the brake systems which actually occur on an axle will be shown on the brake test report; e.g. if only a service brake operates on Axle 1, the secondary and parking headings will not be shown. The percentage imbalance is shown after the test of the second wheel on the axle and an 'L' shown after the brake force result shows that the wheel has locked during the brake test.

In the fourth column of the first non-front axle (normally the second axle), the heading will show either 'Ovality' or 'Fall-Off'. Ovality is no longer checked on other than front steered axles but if the vehicle has an hydraulic element to the brake system, the heading 'Fall-Off' will be triggered as hydraulic pressure fall-off will be measured (see Section 7.4.5).

At the top of the lower block, 'Test Summary', when an HGV or a Trailer is tested and a load of less than 65% of the design axle weight is measured on an axle, other than the front axle of an HGV, the following message will be recorded:

'Insufficient Load on Axle?' (where ? is replaced by axle number)

The Measured Vehicle Weight is then shown totalling all axles of the vehicle which have been tested.

In the Results section, if the designated Secondary brake is a split (dual) Service brake system, two entries will normally be shown for the Secondary, one for each half of the split. The exceptions are when the vehicle has either a duplicate split system or an 'Axle 1' only (code 1100) type of split.

Under the heading 'Pass Value' the relevant test standard is shown, under the 'Test Value' heading the achieved performance is shown and under the 'Result' heading either 'Pass' or 'Fail' is shown. If a front wheel has locked and the FWA has been taken into account to achieve the necessary Test Value, '(FWA)' will be shown after the relevant Test Value and if wheel locks have been taken into account to achieve the overall requirements for a system, '(Locks)' will be shown after the relevant Pass or Fail result.

If either one half of a split system or a separate Secondary brake fails to reach the required performance, a suitable alternative can be sought - normally a progressively operating Parking brake. If an alternative Secondary brake can be considered by the tester, 'Alternative?' will be shown after the 'Fail' result. The CCS cannot make this judgment as the Parking brake has to be progressive and it would have to be re-tested in dynamic form to be considered as a viable alternative for the Secondary brake.

When a HGV or PSV with a split brake system is tested in semi-automatic mode (see Section 11.1) no results will be shown for the secondary brake system. Instead, the following note will appear after the Test Summary:

'No Secondary brake calculations due to unknown split system'

When a failure for Bind, Ovality, Fall-Off, Imbalance or 'Little or No Brake Effort' has occurred, an 'Unsatisfactory Wheel Performance' table will be printed out detailing the values achieved.

In normal circumstances the 'Overall Result' will be followed by either 'Passed' or 'Failed' but there are two other entries:

i) If the vehicle is a ULTAST which has failed because insufficient brake performance was achieved when all six wheels locked the message will read:

**** Test Result: Failed **** Free Loaded Retest

The process leading to the above message is illustrated in Appendix 14.

ii) If the test is aborted the message will read:

**** No Overall Test Result: Test Aborted ****

And finally, the numbers printed at the bottom right of the report have the following meaning:

985.0	Version of CCS used *(see Section 4.9)*
98A.0	Version brake master database used
256	Duration of test in seconds
AUTO	Mode of brake test *(see Section 11.1)*
SEMI	Mode of brake test *(see Section 11.1)*
U	Shown when a 3-axle semi-trailer is tested as an ULTAST *(see Section 8.5)*
P	Shown when a 3-axle semi-trailer is tested as Part Laden *(see Section 8.5)*

If a similar brake test report is developed, it is essential to record the first two version numbers, desirable to include the duration and highly desirable, if not essential, to identify which of the three test modes has been used. The position of all of these can be wherever is convenient.

Note: On VOSA printouts the current RBT manufacturer's address and telephone number appears prior to the above numbers but the manufacturer's information has been excluded from all RBT printouts shown in this document.

12.1 Heavy Goods Vehicles

A series of "Illustrative" brake test reports for HGVs is shown in Appendix 18, all are real tests but 'Example' has been substituted for the GVTS name. The following statements apply to all similar HGV brake test reports (it must be noted that subsequent to these reports being produced brake details Dtp numbers may have been altered - the rules would still apply for relevant entries though) :

* The percentage imbalance is shown for each axle after the test of the second wheel and, as the brake test on HGVs is done one wheel at a time, the imbalance shown compares the values obtained at maximum brake force only. For more details see Section 7.4.3.
* Ovality is measured only on front steered axles.
* Fall-off is measured on each rear axle when the brake system has an hydraulic element.

- A brake test report for a typical 2-axle rigid HGV with a split braking system (Dtp No 3008S) is shown in Appendix 18, Page 1. The brake test report shows;

a) a question will have been asked to ascertain if the vehicle had Drum or Disk

brakes - this had Disk

b) it was a ‘Full’ test.
c) most wheels locked during the brake test.
d) fall-off of brake pressure has been measured on the rear axle in place of ovality.
e) the vehicle was well loaded. *(5984kg presented, 7490kg GVW*)
f) insufficient load is indicated on Axle 2.
(65% x Design axle weight of 5200kg (from master.dta) is 3380kg, presented is 3212kg)
g) the performance of each half of the split system is shown separately in the test summary.
h) the Parking brake was assessed against 12% GTW as that is greater than 16% GVW.
i) the vehicle has ‘Passed’.

- A brake test report for a 2-axle rigid HGV with a separate Secondary brake system (Dtp No 3839) is shown in Appendix 18, Page 2. The brake test report shows;

a) it was a ‘Full’ test.
b) both front wheels locked during the Service brake test.
c) an imbalance of 35% is not a failure as it is not assessed on the Secondary brake system.
d) the vehicle was fully loaded.
(11870kg presented, 11000kg GVW - the VI Load Simulator may have caused overload).
e) the FWA had to be taken into account to achieve the Service brake requirements.
f) the Parking brake was assessed against 16% GVW as that is greater than 12% GTW.
g) the vehicle has ‘Passed’.

- A brake test report for a 3-axle rigid HGV with a split braking system (Dtp No 4368) is shown in Appendix 18, Page 3. The brake test report shows;

a) it was a ‘Full’ test..
b) various wheels locked during the test.
c) an imbalance of 32% is a failure for the Service brake but 42% for the Parking brake is not
d) the vehicle was not well loaded.
(12906kg presented, 26000kg GVW;- note ‘Insufficient Load on Axle 2, 3' entry)
e) the FWA had to be taken into account twice to achieve the brake system requirements.
f) wheel locks had to be taken into account twice to achieve the brake system requirements.
g) the performance of each half of the split system is shown separately in the test summary and the vehicle has failed on one half of the split.
h) the Unsatisfactory Wheel Performance table shows the imbalance failure
i) the vehicle has ‘Failed’. *(for the two reasons described in ‘c & g’)*

- A brake test report for a 3-axle Tractor Unit with a separate Secondary brake system (Dtp No 3858S) is shown in Appendix 18, Page 4. The brake test report shows;

a) a question will have been asked to ascertain if the vehicle had Park brake on

axle 2 - the answer in this case would have been NO
b) it was a ‘Full’ test.
c) most wheels locked apart from the second axle.
d) the vehicle was well loaded.
(19182kg presented, 22500kg GVW)
e) the FWA had to be taken into account to achieve the Service brake requirements.
f) wheel locks had to be taken into account to achieve the Secondary brake requirements
g) the vehicle has ‘Passed’.

- A brake test report for a 4-axle rigid HGV with a split braking system (Dtp No 5243M) is shown in Appendix 18, Page 5. The brake test report shows;

a) a question will have been asked to ascertain if the vehicle had Park brake on axle 2 - the answer in this case would have been YES
b) it was a ‘Full’ test.
c) various wheels locked during the test.
d) ovality is measured on both front axles but not on the rear axles.
e) the vehicle was well loaded.
(27457kg presented, 33000kg GVW)
f) the FWA had to be taken into account twice to achieve the brake system requirements.
g) wheel locks had to be taken into account to achieve the requirements for one half of the split.
h) the vehicle has ‘Passed’.

- A brake test report for a 4-axle rigid HGV with a separate Secondary brake system (Dtp No 5379L) is shown in Appendix 18, Page 6. The brake test report shows;

a) a question will have been asked to ascertain if the vehicle had Secondary & Park brake on axle 1 - the answer in this case would have been YES
b) it was a ‘Full’ test.
c) most wheels locked apart from the front axle.
d) ovality is measured on both front axles but not on the rear axles.
e) an imbalance of 48% is not a failure as both wheels locked.
f) the vehicle was well loaded. *(25529kg presented, 32000kg GVW)*
g) the FWA had to be taken into account to achieve the Service brake requirements.
h) the Secondary brake system failed and the trigger ‘Alternative?’ has been printed.
(but the Parking brake, at 19%, was not a suitable alternative)
i) the vehicle has ‘Failed’. *(for the reason described in ‘g’)*

- A brake test report for a 3-axle rigid HGV with a split braking system and a ‘B’ prefix Dtp No (Dtp No B03479) is shown in Appendix 18, Page 7. *(The ‘B’ prefix Dtp No shows that the vehicle had been modified since original manufacture).* The brake test report shows;

a) it was a ‘Full’ test.
b) all wheels locked during the test.
c) neither the 44% nor the 41% imbalance are failures as both wheels locked on the Service and imbalance is not assessed on Parking.

d) the vehicle was not well loaded.
(10220kg presented, 17000kg GVW:- note 'Insufficient Load on Axle 2, 3' entry)
e) taking account of FWA alone did not enable the Service brake requirements to be met and wheel locks had to be taken into account; the vehicle passed Service on locks.
f) no Secondary brake performance is shown.
(Note 'No Secondary brake calculation due to unknown split system' entry)
g) the vehicle has 'Passed'.
h) 'SEMI' is shown at bottom right to indicate that the test was conducted in semi-automatic mode, due to not being in the database at that time. *(A normal test will show 'AUTO' and there would be a vehicle make given in header section)*
i) *NOTE* - although this vehicle obtained a Pass rating it didn't have its Secondary system assessed and therefore its effectiveness was only based on a visual examination of its components functioning.

12.2 Trailers

A series of brake test reports for Trailers is shown in Appendix 19, all are real tests but 'Example' has been substituted for the GVTS name. The following statements apply to all Trailer brake test reports:

* No entry is shown for 'Vehicle Make'
* No entry (not even 'Pass') is shown under 'Time Lag'
* No entry is shown under 'Ovality' as neither Ovality nor Fall-Off is measured on Trailers
* The percentage imbalance is shown for each axle after the test of the second wheel and, as the brake test on Trailers is done one wheel at a time, the imbalance shown compares the values obtained at maximum brake force only. For more details see Section 7.4.3.
* No headings for Secondary are shown as the Secondary brake is not assessed on Trailers.

- A brake test report for a Pre-1968 2-Axle Semi-Trailer (Dtp No 244110) is shown in Appendix 19, Page 1. The brake test report shows;

a) it was a 'Full' test.
b) 'Pre 1968' is shown after the Dtp No entry.
c) a value for TAW is shown in addition to the GVW.
d) some wheels locked during the test.
a) the vehicle has failed on Bind on axle 2.
b) the vehicle was only lightly loaded.
(6704kg presented, 20200kg TAW:- note 'Insufficient Load on Axle 1, 2' entry)
g) a pass value of 35% is required for Service. *(Pre-1968 requirements)*
h) the vehicle has failed to achieve the required Service brake performance.
i) a zero performance requirement is shown for Parking. *(Pre-1968 requirements)*
j) the values of Bind have been shown in the Unsatisfactory Wheel Performance table.
k) the vehicle has 'Failed'. *(for the reasons described in 'e & h'')*

- A brake test report for a Post-1968 2-Axle Semi-Trailer (Dtp No 241010) is shown in Appendix 19, Page 2. The brake test report shows;

a) it was a 'Full' test.

b) 'Post 1968' is shown after the Dtp No entry.
c) a value for TAW is shown in addition to the GVW.
d) all wheels locked during the test.
e) an imbalance of 40% is not a failure as both wheels locked.
f) the vehicle was partly loaded.
(12496kg presented, 20200kg TAW:- note 'Insufficient Load on Axle 1' entry)
g) a pass value of 40% is required for Service. *(Post 1968 requirements)*
h) wheel locks had to be taken into account to meet the Parking brake requirements.
i) the vehicle has 'Passed'.

- A brake test report for a Type Approved 2-Axle Semi-Trailer (Dtp No 245337) is shown in Appendix 19, Page 3. The brake test report shows;

a) it was a 'Full' test.
b) 'Type Approved' is shown after the Dtp No entry.
c) a value for TAW is shown in addition to the GVW.
d) all wheels locked during the test.
e) the vehicle was partly loaded.
(12232kg presented, 20200kg TAW:- note 'Insufficient Load on Axle 1, 2' entry)
f) a pass value of 45% is required for Service. *(Type Approved requirements)*
g) wheel locks had to be taken into account to meet the Service brake requirements.
h) the vehicle has 'Passed'.

- A brake test report for a Type Approved 3-Axle Semi-Trailer (Dtp No 307233) is shown in Appendix 19, Page 4. The brake test report shows;

a) it was a 'Full' test.
b) 'Type Approved' is shown after the Dtp No entry.
c) a value for TAW is shown in addition to the GVW.
d) only two wheels locked during the test.
e) an 82% imbalance on Parking is not a failure.
f) the o/s wheel of axle 2 has failed on Bind.
g) the vehicle was well loaded.
(22789kg presented, 24000kg TAW)
h) the Parking brake failed to reach the 16% requirement.
i) the Bind value and three brake force values which failed to reach the 'little or no brake effort threshold' value are shown in the Unsatisfactory Brake Performance table.
j) the vehicle has 'Failed'. *(for the reasons described in 'f , h & i')*

- A brake test report for a Post 1968 3-Axle Semi-Trailer (Dtp No 308430) tested as an ULTAST is shown in Appendix 19, Page 5. The brake test report shows;

a) it was a 'Full' test.
b) 'Post 1968' is shown after the Dtp No entry.
c) a value for TAW is shown in addition to the GVW.
d) all wheels locked during the test.
e) an imbalance of 32% on Parking is not a failure.
f) the vehicle was 'unladen'.
(4758kg presented, 24600kg TAW;- note 'Insufficient Load on Axle 1, 2, 3' entry)

g) the ULTAST rules were used to reach the Service brake requirement. *(note '(>= 3000kg)' entry after 'PASS')*
h) the ULTAST rules were used to reach the Parking brake requirement. *(note '(>= 1500kg)' entry after 'PASS')*
i) the vehicle has 'Passed'.
j) note 'U' at bottom right to indicate that the ULTAST rules have been applied.

- A brake test report for a 2-Axle Full Draw-Bar Trailer (no Dtp No, tested in semi-automatic mode) is shown in Appendix 19, Page 6. The brake test report shows;

a) it was a 'Full' test.
b) nothing is shown in the Dtp No entry.
c) no value for TAW is shown as it would be the same as the GVW.
d) only one wheel locked during the test.
e) an imbalance of 68% on Service is a failure but 74% on Parking is not.
f) the o/s front wheel has failed for bind.
g) the vehicle was partly loaded. *(6089kg presented, 10200kg GVW;- see 'Insufficient Load on Axle 1' entry)*
h) FWA has been taken into account for the Service brake. *(see Section 8.4.1)*
i) the vehicle failed to reach the Service brake performance requirement. *(Type Approval requirements (45%) were selected when details of trailer were set up)*
j) the 68% imbalance and bind value is shown in the Unsatisfactory Brake Performance table.
k) the vehicle has 'Failed'. *(for the reasons described in 'e. f & i')*
l) 'SEMI' is shown at bottom right to indicate the test was conducted in semi-automatic mode.

12.3 Public Service Vehicles

Two brake test reports for PSVs are shown in Appendix 20, both are real tests but 'Example' has been substituted for the GVTS name. The following statements apply to all PSV brake test reports:

* The percentage imbalance is shown for each axle after the test of the second wheel and, as the brake test on a PSV is done one wheel at a time, the imbalance shown compares the values obtained at maximum brake force only. For more details see Section 7.4.3 .
* Ovality is measured only on front steered axles.

- A brake test report for a Pre-1968 2-axle PSV with a separate Secondary brake system (Dtp No 074122) is shown in Appendix 20, Page 1. The brake test report shows;

a) it was a 'Full' test.
b) 'Pre 1968' is shown after the Dtp No entry.
c) all wheels locked during the Service brake test.
d) the imbalances of 32%, 31% and 34% are not failures as on the Service both wheels locked and imbalance is not assessed on either Secondary or Parking.
e) the Service brake was assessed against 50% ULW as wheel lock occurred and it passed.
f) the Secondary brake was assessed against 22% LW as no wheels locked and it failed.

g) a zero performance requirement is shown for Parking.
(Pre-1968 requirements but 'Little or No Brake Effort' requirements must be met)
h) the vehicle has 'Failed'. *(for the reason described in 'f')*

- A brake test report for a Post-1968 2-axle PSV with a split braking system (Dtp No 134202) is shown in Appendix 20, Page 2. The brake test report shows;

a) it was a 'Full' test.
b) 'Post 1968' is shown after the Dtp No entry.
c) only the wheels on axle 2 locked during the Service brake test.
d) an imbalance of 40% is not a failure as imbalance is not assessed on Parking.
e) the Service brake was assessed against 50% ULW as wheel lock occurred.
f) the performance of each half of the split system is shown separately in the test summary.
g) one half of the split brake system was assessed against 22% LW as no wheels locked and the other half was assessed against 25% ULW as wheel lock occurred.
h) the Parking brake was assessed against 16% LW as no wheels locked.
i) the vehicle has 'Passed'.

12.4 Re-Tests

Re-Tests can be done on any type, or class of vehicle selected for any of the following options:

Full Test (which will show 'Service and Secondary and Parking' in heading)
Service only
Service and Secondary
Service and Parking
Secondary only
Secondary and Parking
Parking only

The results printouts will look similar to the normal - with the exception of "retest" inserted. On the brake test printouts for Re-Tests any statement listed in Sections 12.1 to 12.3 will generally apply.

Note: Although a wide range of options are available, it must be mentioned that the basic concept of retesting anything other than the whole brake system is flawed, as in many cases to rectify a low performance in one system, another system will have been tampered with and may have been adversely affected.

Retesting other than the whole system is not recommended

12.5 Voluntary Brake Tests

Voluntary tests can, according to vehicle type, be selected for any of the following options:

Full Test (which will show ‘Service and Secondary and Parking’ in heading)
Service only
Service and Secondary
Service and Parking
Secondary only
Secondary and Parking
Parking only

The results printouts will look similar to the normal - with the exception of "Voluntary test" inserted. On the brake test printouts etc any statement listed in Sections 12.1 to 12.3 will generally apply.

Examples of Brake Data Cards

DTp No 2158A (3 Axle Rigid - Pre Type Approval)

2158 A	E.R.F.	3 AXLE RIGID	GVW 25300 (Kg)	25 R3 RD/TP		2158 A
	TOTAL MINIMUM BRAKE FORCE REQUIRED (Kg)					
	SERVICE			SECONDARY (Axles 1 & 2/1 & 3)		PARKING
	No Front Lock	Front Wheels Locked		No Front Lock	Front Wheels Locked	(No Lock Allowance)
		1 Wheel	2 Wheels		1 Wheel	2 Wheels	
POST 68	12650	10550	8450	6320	4740	3160	4040
VEHICLE AS ORIGINALLY DESIGNED							

SERVICE: FULL AIR SYSTEM OPERATED BY DUAL FOOTVALVE

One half of the dual footvalve feeds air to the brakes of Axles 1 and 2. The other half of the dual footvalve feeds air to the brakes of Axles 1 and 3. (Split System).

SECONDARY: THIS VEHICLE HAS A SPLIT BRAKING SYSTEM

For testing purposes the figures obtained from each axle should be added in the following manner:—

(a) Add brake efforts of Axles 1 and 2
(b) Add brake efforts of Axles 1 and 3

Each separate total must meet the required performance figure for secondary brakes shown above.

PARKING: SPRING BRAKES OPERATED BY HAND CONTROL VALVE

When the hand valve lever is in the "park" position all air is released from the spring brake actuators of the brakes of Axles 2 and 3. The brakes are then held "on" by spring force.

N.B. Ensure that the "applied brake" method of test as described in the technical handbook is used when testing this brake.

1 FWA 2100 (kg)

GVC/78/1

Example of Brake Data Card

DTp No 4074 (4 Axle Rigid - Post Type Approval)

SCANIA	4 AXLE RIGID	GVW 31800	GTW 35300	P92M 8 x 4	4074

TYPE APPROVED VEHICLE - TOTAL MINIMUM BRAKE FORCE REQUIRED (Kg)

SERVICE					SECONDARY (AXLES 1 AND 4)			PARKING GVW	PARKING GTW
No Front Lock	Front Wheels Locked				No Front Lock	Front Wheels Locked		No Lock Allowance	No Lock Allowance
	1 Wheel	2 Wheels	3 Wheels	4 Wheels		1 Wheel	2 Wheels		
15900	13600	11300	9000	6700	7950	5970	3980	5080	-

SERVICE: FULL AIR SYSTEM OPERATED BY DUAL FOOTVALVE
One half of the dual footvalve feeds air to the brakes of Axles 1 and 2 via a load sensing valve. The other half of the dual footvalve feeds air via a load sensing valve to a relay valve which introduces air to the brakes of Axles 3 and 4. (Split System)

SECONDARY: SPRING BRAKES OPERATED BY A DASH MOUNTED HAND CONTROL VALVE
When the hand valve lever is moved towards the "secondary" brake position air is released from the spring brake actuators of the brakes of Axles 1 and 4. Braking is progressive.
(Z7) NOTE: On some models spring brakes are fitted to Axles 2 and 4.

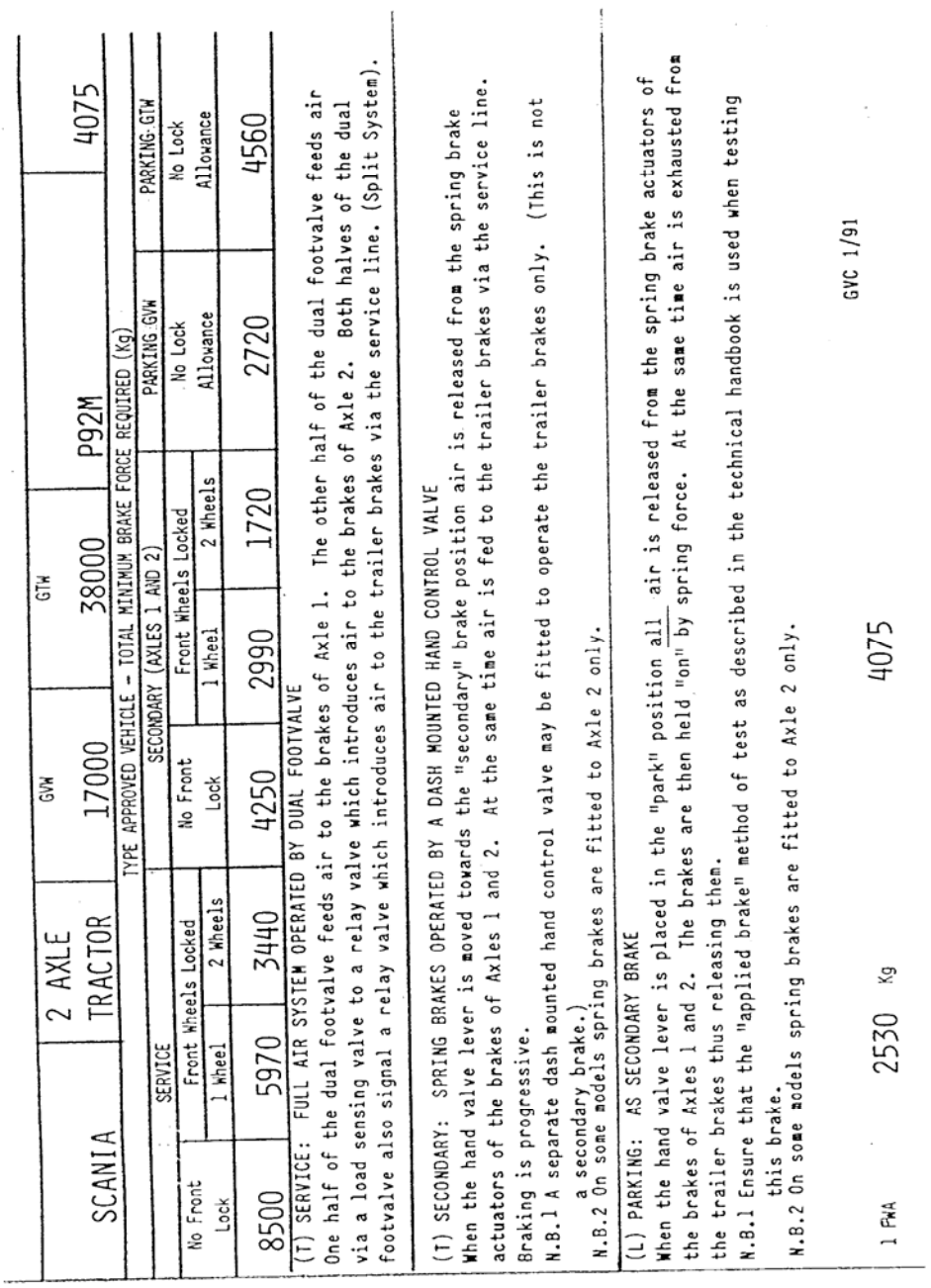
PARKING: AS SECONDARY BRAKE
When the hand valve lever is placed in the "park" position all air is released from the spring brake actuators of Axles 1 and 4. The brakes are then held "on" by spring force.
N.B. Ensure that the "applied brake" method of test as described in the technical handbook is used when testing this brake.

(Z7) NOTE: On some models spring brakes are fitted to Axles 2 and 4.

1 FWA 2300 Kg 4074 GVC 1/91

Example of Brake Data Card

DTp No 4075 (2 Axle Tractor - Post Type Approval)



SCANIA	2 AXLE TRACTOR	GVW 17000	GTW 38000	P92M	4075

TYPE APPROVED VEHICLE – TOTAL MINIMUM BRAKE FORCE REQUIRED (Kg)

SERVICE			SECONDARY (AXLES 1 AND 2)			PARKING GVW	PARKING GTW
No Front Lock	Front Wheels Locked		No Front Lock	Front Wheels Locked		No Lock Allowance	No Lock Allowance
	1 Wheel	2 Wheels		1 Wheel	2 Wheels		
8500	5970	3440	4250	2990	1720	2720	4560

(T) SERVICE: FULL AIR SYSTEM OPERATED BY DUAL FOOTVALVE
One half of the dual footvalve feeds air to the brakes of Axle 1. The other half of the dual footvalve feeds air via a load sensing valve to a relay valve which introduces air to the brakes of Axle 2. Both halves of the dual footvalve also signal a relay valve which introduces air to the trailer brakes via the service line. (Split System).

(T) SECONDARY: SPRING BRAKES OPERATED BY A DASH MOUNTED HAND CONTROL VALVE
When the hand valve lever is moved towards the "secondary" brake position air is released from the spring brake actuators of the brakes of Axles 1 and 2. At the same time air is fed to the trailer brakes via the service line.
Braking is progressive.
N.B.1 A separate dash mounted hand control valve may be fitted to operate the trailer brakes only. (This is not a secondary brake.)
N.B.2 On some models spring brakes are fitted to Axle 2 only.

(L) PARKING: AS SECONDARY BRAKE
When the hand valve lever is placed in the "park" position all air is released from the spring brake actuators of the brakes of Axles 1 and 2. The brakes are then held "on" by spring force. At the same time air is exhausted from the trailer brakes thus releasing them.
N.B.1 Ensure that the "applied brake" method of test as described in the technical handbook is used when testing this brake.
N.B.2 On some models spring brakes are fitted to Axle 2 only.

1 PNA 2530 Kg 4075 GVC 1/91

Example of Brake Data Card

DTp No 4719 (2 Axle Rigid - Post Type Approval)

IVECO FORD	2 AXLE RIGID		GVW 17000	GTW 24500		CARGO 1717 , 1721	4719
TYPE APPROVED VEHICLE – TOTAL MINIMUM BRAKE FORCE REQUIRED (Kg)							
SERVICE			SECONDARY (AXLES 1 AND 2)			PARKING GVW	PARKING GTW
No Front Lock	Front Wheels Locked		No Front Lock	Front Wheels Locked		No Lock Allowance	No Lock Allowance
	1 Wheel	2 Wheels		1 Wheel	2 Wheels		
8500	6120	3740	4250	3060	1870	2720	2940

(C) SERVICE: FULL AIR SYSTEM OPERATED BY A DUAL FOOTVALVE
Both halves of the dual footvalve feed air to the brakes of Axles 1 and 2.
N.B.1: The brakes of Axles 1 and 2 are each fitted with 2 independent brake actuators. A load sensing valve is fitted in the pipelines to Axle 2 (Split System).
N.B.2: When piped for drawbar operation either half of the system will operate the trailer brakes.

(C) SECONDARY: THIS VEHICLE HAS TWO SEPARATE BRAKING SYSTEMS OPERATED BY A DUAL FOOTVALVE
It is not possible to test either of these systems separately without draining the other system's reservoir.
N.B. For the secondary brake test use the service brake gauge readings and compare them with the secondary brake figure shown above.

(D) PARKING: SPRING BRAKES OPERATED BY A HAND CONTROL VALVE
The hand control valve is situated to the left of the driving seat. When the hand valve lever is placed in the "park" position all air is released from the spring brake actuators of the brakes of Axles 1 and 2. The brakes are then held "on" by spring force.
N.B.1: On some models spring brakes are fitted to Axle 2 only.
N.B.2: Ensure that the "applied brake" method of test as described in the technical handbook is used when testing this brake.

GVC 1/89

1 FWA 2380 Kg (56%) 4719

Form definition used to Create MASTER.DTA File

Field No	Description	No of Characters	Character Type
1	DTp Number	6	A/N
2	Vehicle Make	3	N
3	Vehicle Type	2	A/N
4	Brake Routine Number	3	A/N
5	Post/Prior/Pre 1968 Option	1	A
6	Split Routine Number	4	A/N
7	Second Front Axle Steered	1	A
8	Brake Distribution (Service)	2	N
9	Brake Distribution (Secondary)	2	N
10	Transmission Secondary/Park Brake	1	A
11	Secondary Brake on Tractor only	1	A
12	Design Gross Vehicle Weight	4	N
13	Design Gross Train Weight	4	N
14	Design Weight - Axle 1	3	N
15	Design Weight - Axle 2	4	N
16	Design Weight - Axle 3	4	N
17	Design Weight - Axle 4	4	N
18	Design Weight - Axle 5	4	N
19	*No longer used*	-	-
20	*No longer used*	-	-
21	*No longer used*	-	-
22	Service Brake System	2	N
23	Secondary Brake System	2	N
24	Park Brake System	2	N
25	*No longer used*	-	-
26	LSV Fitted	1	A
27	LSV Option	1	A
28	Modulated Braking - Axle 1	1	A
29	Modulated Braking - Axle 2	1	A
30	Modulated Braking - Axle 3	1	A
31	Modulated Braking - Axle 4	1	A
32	Modulated Braking - Axle 5	1	A
33	*No longer used*	-	-
34	Double Drive with No Third Differential	1	A

A = Alpha(betical) N = Numeric(al)

Section of MASTER.DTA Printout - Pre Type Approval

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Section of MASTER.DTA Printout - Post Type Approval

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Section of MASTER.DTA Printout - Modified Vehicles

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B02318,226,2T,302,,1122,,50,99,,,0749,1600,300,0525,,,,,,,05,05,10,,Y,,,Y,,,,,
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Section of VEHMAKE.DTA Printout

121, GENERAL MOTORS (GMC),
124, GINAF,
126, GUY,
140, HANOMAG,
141, HINO,
160, INTERNATIONAL,
161, ISUZU,
162, IVECO,
163, IVECO FORD TRUCKS,
180, JENSEN,
201, KARRIER,
203, KENWORTH,
221, LA FRANCE,
223, LAND ROVER,
224, LEYLAND,
226, LEYLAND DAF,
227, LEYLAND REDLINE,
228, LANDMASTER,
241, MACK,
242, MAGIRUS DEUTZ,
243, MAN,
245, MCW,
246, MERCEDES BENZ,
250, MITSUBISHI,
253, MORRIS,
255, MUNICIPAL TRAILERS,
257, MOTOR IBERICA,
262, NEOPLAN,
266, NISSAN,
301, PEGASO,
302, PEUGEOT,
340, RENAULT,
342, REYNOLDS BOUGHTON,
343, ROMAN,
345, ROBERTS LEYLAND,
360, SAVIEM,
361, SAURER,
362, SCAMMELL,
363, SCANIA,

Printout of VEHTYPE.DTA File

1C, 1 AXLE CENTRE DRAW-BAR
1D, 1 AXLE DRAW-BAR TRAILER
1S, 1 AXLE SEMI-TRAILER
24, 2 AXLE CLASS IV
25, 2 AXLE CLASS V
27, 2 AXLE CLASS VII
2C, 2 AXLE CENTRE DRAW-BAR
2D, 2 AXLE DRAW-BAR TRAILER
2L, 2 AXLE LIGHT MOTOR CAR
2P, 2 AXLE PSV
2R, 2 AXLE RIGID HGV
2S, 2 AXLE SEMI-TRAILER
2T, 2 AXLE TRACTOR UNIT
34, 3 AXLE CLASS IV
35, 3 AXLE CLASS V
37, 3 AXLE CLASS VII
3A, 3 AXLE ARTICULATED PSV
3C, 3 AXLE CENTRE DRAW-BAR
3D, 3 AXLE DRAW-BAR TRAILER
3L, 3 AXLE LIGHT MOTOR CAR
3P, 3 AXLE PSV
3R, 3 AXLE RIGID HGV
3S, 3 AXLE SEMI-TRAILER
3T, 3 AXLE TRACTOR UNIT
4A, 4 AXLE ARTICULATED PSV
4D, 4 AXLE DRAW-BAR TRAILER
4L, 4 AXLE LIGHT MOTOR CAR
4P, 4 AXLE PSV
4R, 4 AXLE RIGID HGV
4S, 4 AXLE SEMI-TRAILER
4T, 4 AXLE TRACTOR UNIT
SP, SPECIAL PURPOSE VEH/TRL

Printout of BRAKROUT.DTA File

301, 1+2, SPLIT, 1
302, 1+2, SPLIT, 2
303, 1+2, SPLIT, 1+2
312, 1+2, 1, 2
313, 1+2, 1, 1+2
322, 1+2, 2, 2
323, 1+2, 2, 1+2
332, 1+2, 1+2, 2
333, 1+2, 1+2, 1+2
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703, 1+2+3, SPLIT, 1+2
704, 1+2+3, SPLIT, 3
705, 1+2+3, SPLIT, 1+3
706, 1+2+3, SPLIT, 2+3
707, 1+2+3, SPLIT, 1+2+3
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F06, 1+2+3+4, SPLIT, 2+3
F08, 1+2+3+4, SPLIT, 4
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F0C, 1+2+3+4, SPLIT, 3+4
F0E, 1+2+3+4, SPLIT, 2+3+4
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F66, 1+2+3+4, 2+3, 2+3
F77, 1+2+3+4, 1+2+3, 1+2+3
F99, 1+2+3+4, 1+4, 1+4
FAA, 1+2+3+4, 2+4, 2+4
FBA, 1+2+3+4, 1+2+4, 2+4
FBB, 1+2+3+4, 1+2+4, 1+2+4
FCC, 1+2+3+4, 3+4, 3+4
FDC, 1+2+3+4, 1+3+4, 3+4
FDD, 1+2+3+4, 1+3+4, 1+3+4
FEC, 1+2+3+4, 2+3+4, 3+4
FEE, 1+2+3+4, 2+3+4, 2+3+4
FFF, 1+2+3+4, 1+2+3+4, 1+2+3+4
F0D, 1+2+3+4, SPLIT, 1+3+4

Printout of SPLITROU.DTA File

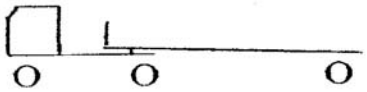
1100, AXLE 1 ONLY
1122, AXLE 1 & AXLE 2
1133, AXLE (1*0.6) & AXLES (1*0.4) + 2
1166, AXLE 1 & AXLES 2 + 3
1177, AXLE (1*0.6) & AXLES (1*0.4) + 2 + 3
1221, N/S/AXLE1 + O/S/AXLE2 & O/S/AXLE1 + N/S/AXLE2
3113, AXLES (1*0.5) + N/S/2 & AXLES (1*0.5) + O/S/2
3146, AXLES 1 + N/S/2 & AXLES 3 + O/S/2
3333, AXLES 1 + 2 & AXLES 1 + 2
3344, AXLES 1 + 2 & AXLE 3
3355, AXLES 1 + 2 & AXLES 1 + 3
3366, AXLES 1 + 2 & AXLES 2 + 3
3377, AXLES 1 + 2 & AXLES 1 + 2 + 3
33CC, AXLES 1 + 2 & AXLES 3 + 4
5522, AXLES 1 + 3 & AXLE 2
5566, AXLES 1 + 3 & AXLES 2 + 3
5577, AXLES 1 + 3 & AXLES 1 + 2 + 3
55AA, AXLES 1 + 3 & AXLES 2 + 4
7337, AXLES 1 + 2 + N/S/3 & AXLES 1 + 2 + O/S/3
7777, AXLES 1 + 2 + 3 & AXLES 1 + 2 + 3
9966, AXLES 1 + 4 & AXLES 2 + 3
FFFF, AXLES 1 + 2 + 3 + 4 & AXLES 1 + 2 + 3 + 4

Printout of BRAKTYPE.DTA File

01, MECHANICAL
02, AIR ASSISTED MECHANICAL
03, HYDRAULIC
04, VACUUM HYDRAULIC
05, AIR HYDRAULIC
06, VACUUM
07, AIR
08, POWER HYDRAULIC
09, LOCK ACTUATOR
10, SPRING
11, ELECTRIC
12, AIR AND SPRING
13 AIR HYDRAULIC AND AIR
14, VAC OR AIR ASSISTED HYD
15, VAC/HYD ASSISTED MECH
16 AIR HYDRAULIC OR AIR

Schematic Diagram of Trailer Types

1 axle semi-trailer



2 axle semi-trailer

3 axle semi-trailer

4 axle semi-trailer

1 axle centre-axle drawbar trailer

2 axle centre-axle drawbar trailer

3 axle centre-axle drawbar trailer

2 axle full drawbar trailer

3 axle full drawbar trailer

4 axle full drawbar trailer

Section of 1ATRL.DTA Printout

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8750,5000,,5000,096
8750,5200,,5200,097
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9000,5000,,5000,101
9000,5500,,5500,102
9000,6100,,6100,103
9000,6200,,6200,104
9000,6600,,6600,554
9000,7100,,7100,555
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9250,9400,,9400,107
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9750,5800,,5800,114
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Section of 2ATRL.DTA Printout

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19750,6300,6300,,,,,12600,117
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19750,8100,8100,,,,,16200,121
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20000,6500,6500,,,,,13000,125
20000,6700,6700,,,,,13400,126
20000,7100,7100,,,,,14200,127
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Section of 3ATRL.DTA Printout

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22000,6000,6000,6000,,,,18000,523
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26750,6100,6100,6100,,,,18300,003
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82000,13000,13000,13000,13000,,,52000,005

Brake Performance Requirements (Heavy Goods Vehicles)

TYPE OF VEHICLE	BRAKE PERFORMANCE REQUIREMENTS									
	Pre-1968		Prior-1968		Post-1968			Type Approved		
	Service	Sec.	Service	Sec	Service	Sec	Park	Service	Sec	Park
RIGID VEHICLES: a) 2 axle b) More than 2 axles c) All Vehicles	45%GVW 40%GVW -	20%GVW 15%GVW -	- - 50%GVW	- - 25%GVW	- - 50%GVW	- - 25%GVW	- - 16%GVW	- - 50%GVW	- - 25%GVW	- - 12%GTW 16%GVW
ARTICULATED TRACTORS: a) Secondary brake only on Tractor b) Secondary brake on Tractor and Trailer	40%GVW 40%GVW	15%GTW 15%GVW	50%GVW 50%GVW	25%GTW 25%GVW	50%GVW 50%GVW	25%GTW 25%GVW	16%GVW 16%GVW	n/a 50%GVW	n/a 25%GVW	n/a 12%GTW 16%GVW

Notes:

1. Pre-1968 — First used before 1 January 1968 having no manufacturer's plate.
2. Prior-1968 — First used before 1 January 1968 having a manufacturer's plate.
3. Post 1968 — First used on or after 1 January 1968 having a manufacturer's plate.
4. GVW — Design gross vehicle weight.
5. GTW — Design gross train weight
6. There is no performance requirement for the Parking brake on Pre -1968 & Prior - 1968 vehicles but the minimum requirement for little or no brake effort should be achieved.

Brake Performance Requirements (Trailers)

TYPE OF TRAILER	BRAKE PERFORMANCE REQUIREMENTS							
	Pre-1968		Prior-1968		Post-1968		Manufactured on or after 1 Oct 1982	
	Serv	Park	Serv	Park	Serv	Park	Serv	Park
Semi-Trailer with design GVW of less than 6100 kg	32% TAW	*	32% TAW	*	40% TAW	16% GVW	45% TAW	16% GVW
Semi-Trailer with design GVW of 6100 kg or more	35% TAW	*	35% TAW	*	40% TAW	16% GVW	45% TAW	16% GVW
Draw-Bar Trailer	40% GVW	*	40% GVW	*	50% GVW	16% GVW	45% GVW	16% GVW

Notes:

1. Pre-1968 First used before 1 January 1968 having no manufacturer's plate.
2. Prior-1968 First used before 1 January 1968 having a manufacturer's plate.
3. Post 1968 First used on or after 1 January 1968 having a manufacturer's plate.
4. TAW Total design weight on the axle(s) only.
5. GVW **Design** gross vehicle weight.
6 There is no requirement to test the Secondary brake on trailers.
7. (*) There is no performance requirement for the Parking brake for Pre-1968 & Prior 1968 trailers but the minimum requirement for little or no brake effort should be achieved.

Brake Performance Requirements (Unladen Tri-Axle Semi-Trailers)

1. Service Brake

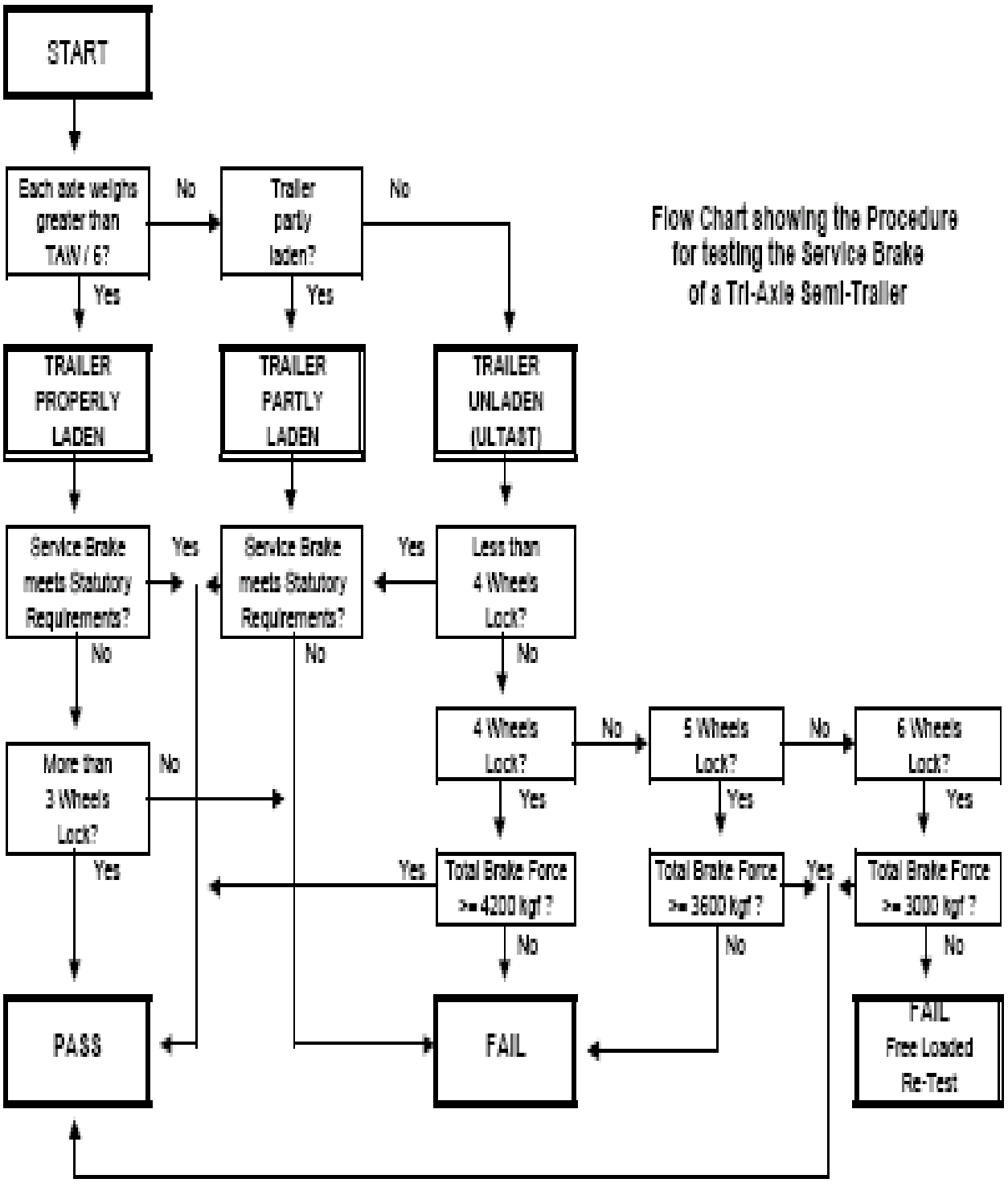
Table 1 is applicable to an unladen Tri-Axle Semi-Trailer (ULTAST) when tested on a RBT

No of Wheels Locking	Minimum Brake Force Required to Pass (kg)
6	3000
5	3600
4	4200

2. Parking Brake

Table 3 is applicable to ULTAST's when testing the Parking brake system.

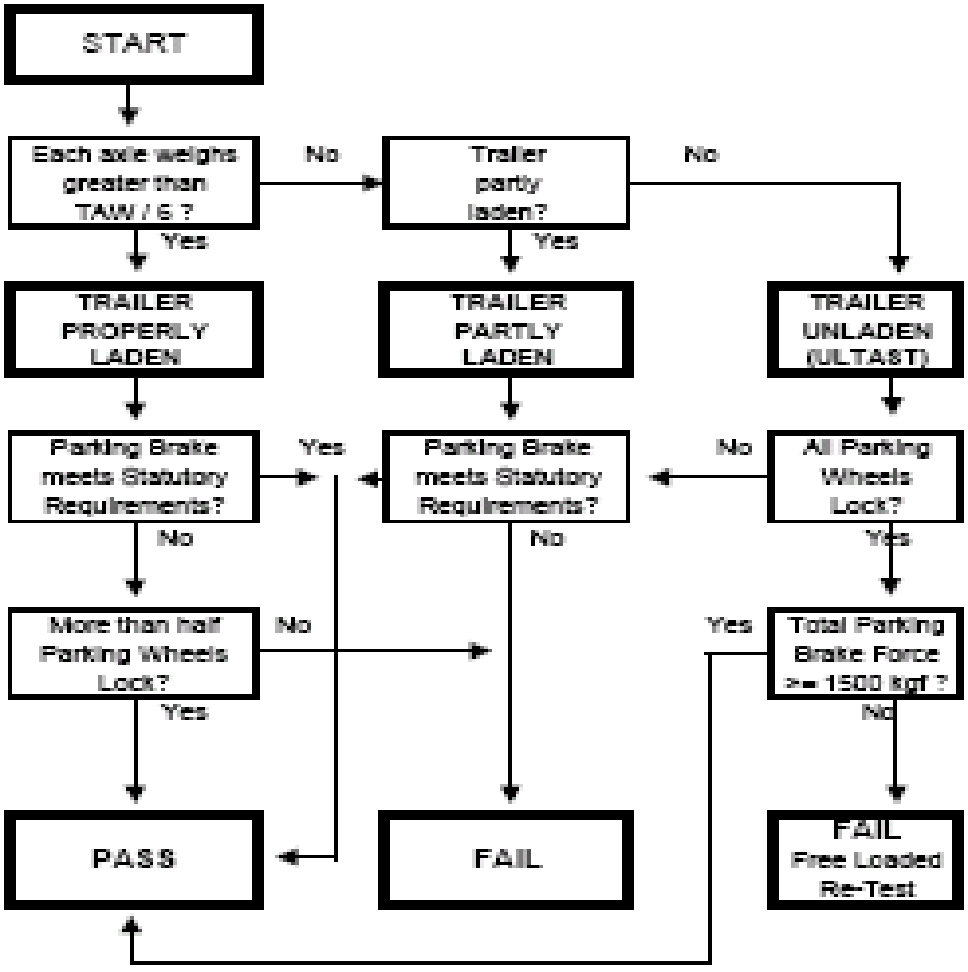
No of Wheels Locking	Minimum Brake Force Required to Pass (kg)
ALL wheels on which the Parking brake operates **LOCK**	1500 kg
ANY wheel on which the Parking brake operates **DOES NOT LOCK**	16% GVW



Flow Chart showing the Procedure for testing the Service Brake of a Tri-Axle Semi-Trailer

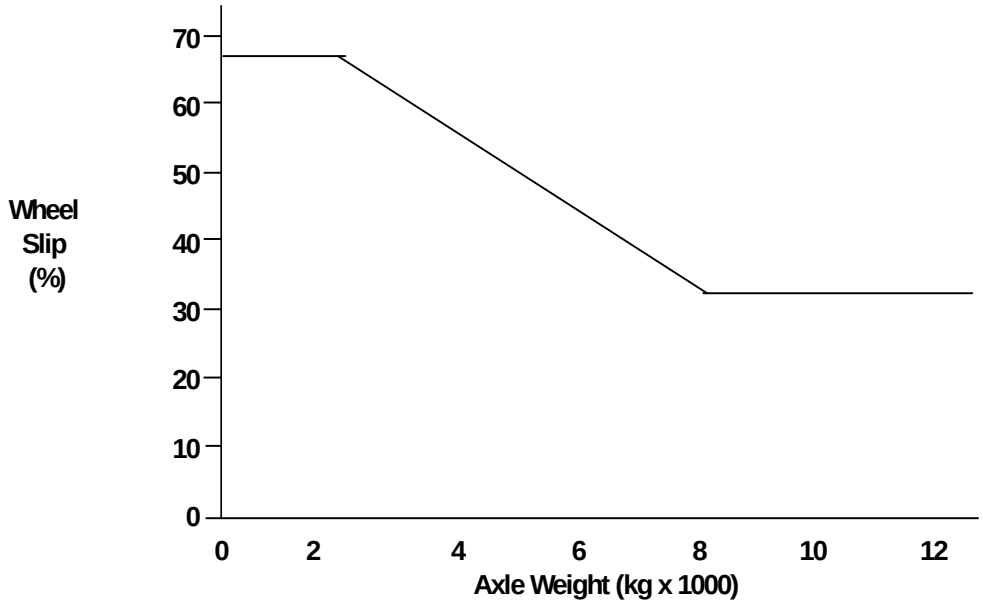
ULTAST Park

Annex N
Page 2



Flow Chart showing the Procedure for testing the Parking Brake of a Tri-Axle Semi-Trailer

Variable slip - Graph showing the Relationship between Wheel Slip and Axle Weight



Brake Performance Requirements (Public Service Vehicles)

1. The following table is applicable when no wheels lock during the brake test of any system:

Brake System	Pre-1968	Post-1968
Service	45% LW/GVW	45% LW/GVW
Secondary	22% LW/GVW	22% LW/GVW
Parking	*	16% LW/GVW

LW Laden Weight
GVW Gross Vehicle Weight
* There is no performance requirement for the Parking brake for Pre-1968 PSVs but the minimum requirement for little or no brake effort should be achieved.

2. The following table is applicable when up to and including half the wheels lock during the brake test of any system:

Brake System	Pre-1968	Post-1968
Service	50% ULW	50% ULW
Secondary	25% ULW	25% ULW
Parking	*	16% ULW

ULW Unladen Weight
* There is no performance requirement for the Parking brake for Pre-1968 PSVs but the minimum requirement for little or no brake effort should be achieved.

3. If more than half the wheels lock on any system, that system shall be deemed to have met the necessary performance requirements.

Brake Test Report Format

DETAILED BRAKE TEST RESULTS - *FULL TEST / RETEST / VOLUNTARY BRAKE TEST* *1762*

License No. :
DTp Number : GVTS :
Vehicle Make : Date : Time :
Vehicle Type : *GVW* : *GTW/TAW* :
Vehicle reg. :

Axle 1 - kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX FORCE
Service	N/S	*Pass/Fail*	*Pass*	*Pass/Fail*	*2000kgf*	*2000kgf (L)*
	O/S	*Pass/Fail*	*Pass*	*Pass/Fail*	*1800kgf (10%)*	*1800kgf*
Secondary	N/S					
	O/S					
Parking	N/S					
	O/S					

Axle 2 - kg

		BIND	TIME LAG	*OVALITY/FALL-OFF*	IMBALANCE	MAX FORCE
Service	N/S					
	O/S					
Secondary	N/S					
	O/S					
Parking	N/S					
	O/S					

TEST SUMMARY *INSUFFICIENT LOAD ON AXLE 1 / 2 / 3 / 4*

Measured Vehicle Weight = kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	*50% GVW*	*60% (FWA)*	*PASS/FAIL (Locks)*
Secondary	:	*25% GVW*	*31% (FWA)*	*PASS/FAIL*
Secondary	:	*25% GVW*	*23%*	*PASS/FAIL Alternative?*
Parking :		*16%GVW/12% GTW*	*17%*	*PASS/FAIL*

No Secondary brake calculations due to unknown split system

UNSATISFACTORY WHEEL PERFORMANCE

AXLE/BRAKE	BIND		TIME LAG		OVALITY		IMBALANCE	MAX. FORCE	
	N/S	O/S	N/S	O/S	N/S	O/S		N/S	O/S
2/Service									

****** OVERALL RESULT : *PASSED / FAILED* **** *FREE LOADED RETEST***
****** NO OVERALL TEST RESULT : TEST ABORTED *******

Voluntary brake, light and emission tests for all types of vehicle are available in the VOSA Goods Vehicle Test Stations. Please ask for details at reception.

Example of Brake Test Report for 2-Axle HGV

DETAILED BRAKE TEST RESULTS - FULL TEST 578

DTp Number : 3008S TYPE APPROVED GVTS : Example
Vehicle Make: IVECO FORD TRUCKS Date : Thu 01/04/1999 Time : 08:42:10
Vehicle Type: 2 AXLE RIGID HGV GVW : 7490kg GTW : 10990kg

AXLE 1 - 2772kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	1104kg	1104kg (L)
	O/S	Pass	Pass	Pass	1075kg (2%)	1075kg (L)

AXLE 2 - 3212kg

		BIND	TIME LAG	FALL-OFF	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	1042kg	1042kg
	O/S	Pass	Pass	Pass	1175kg (11%)	1175kg (L)
Parking	N/S				1070kg	1070kg (L)
	O/S				1048kg (2%)	1048kg (L)

TEST SUMMARY *INSUFFICIENT LOAD ON AXLE 2*

Measured Vehicle Weight = 5984kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	50% GVW	59%	PASS
Secondary	:	25% GVW	29%	PASS
Secondary	:	25% GVW	30%	PASS
Parking	:	12% GTW	19%	PASS

****** OVERALL RESULT: PASSED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/148/AUTO

Example of Brake Test Report for 2-Axle HGV

DETAILED BRAKE TEST RESULTS - FULL TEST 232

DTp Number : 3839 TYPE APPROVED GVTS : Example
Vehicle Make: MERCEDES BENZ Date : Sat 13/03/1999 Time : 08:57:54
Vehicle Type: 2 AXLE RIGID HGV GVW : 11000kg GTW : 14500kg

AXLE 1 - 3212kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	1279kg	1279kg (L)
	O/S	Pass	Pass	Pass	1070kg (16%)	1070kg (L)

AXLE 2 - 8658kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		1273kg	1273kg
	O/S	Pass	Pass		1506kg (15%)	1506kg
Secondary	N/S				1363kg	1363kg
	O/S				2113kg (35%)	2113kg
Parking	N/S				1470kg	1470kg
	O/S				2085kg (29%)	2085kg

TEST SUMMARY
Measured Vehicle Weight = 11870kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	50% GVW	53% (FWA)	PASS
Secondary	:	25% GVW	32%	PASS
Parking	:	16% GVW	32%	PASS

****** OVERALL RESULT: PASSED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/192/AUTO

Example of Brake Test Report for 3-Axle HGV

DETAILED BRAKE TEST RESULTS - FULL TEST 627

DTp Number : 4368 TYPE APPROVED GVTS : Example
Vehicle Make: HINO Date : Fri 02/04/1999 Time : 09:02:50
Vehicle Type: 3 AXLE RIGID HGV GVW : 26000kg GTW : 26000kg

AXLE 1 - 5237kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	1673kg	1673kg (L)
	O/S	Pass	Pass	Pass	1842kg (9%)	1842kg

AXLE 2 - 3817kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		1392kg	1392kg (L)
	O/S	Pass	Pass		1721kg (19%)	1721kg (L)
Parking	N/S				1442kg	1442kg (L)
	O/S				1423kg (1%)	1423kg

AXLE 3 - 3852kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		1651kg	1651kg (L)
	O/S	Pass	Pass		1109kg (32%)	1109kg
Parking	N/S				1392kg	1392kg
	O/S				800kg (42%)	800kg

TEST SUMMARY *INSUFFICIENT LOAD ON AXLE 2, 3*
Measured Vehicle Weight = 12906kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	50% GVW	42% (FWA)	PASS (Locks)
Secondary	:	25% GVW	20% (FWA)	FAIL
Secondary	:	25% GVW	23%	PASS (Locks)
Parking	:	16% GVW	19%	PASS

UNSATISFACTORY WHEEL PERFORMANCE

AXLE/BRAKE	BIND		TIME LAG		OVALITY		IMBALANCE	MAX. FORCE	
	N/S	O/S	N/S	O/S	N/S	O/S		N/S	O/S
3/Service							32%		

****** OVERALL RESULT: FAILED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/285/AUTO

Example of Brake Test Report for 3-Axle Tractor Unit

DETAILED BRAKE TEST RESULTS - FULL TEST 1016

DTp Number : 3858S TYPE APPROVED GVTS : Example
Vehicle Make: MAN Date : Sat 24/04/1999 Time : 10:51:09
Vehicle Type: 3 AXLE TRACTOR UNIT GVW : 22500kg GTW : 44000kg

AXLE 1 - 5536kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	2282kg	2282kg (L)
	O/S	Pass	Pass	Pass	1864kg (18%)	1864kg (L)

AXLE 2 - 5197kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		1747kg	1747kg
	O/S	Pass	Pass		1390kg (20%)	1390kg

AXLE 3 - 8449kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		3037kg	3037kg (L)
	O/S	Pass	Pass		2333kg (23%)	2333kg
Secondary	N/S				3127kg	3127kg (L)
	O/S				2350kg (24%)	2350kg (L)
Parking	N/S				3071kg	3071kg (L)
	O/S				2284kg (25%)	2284kg (L)

TEST SUMMARY
Measured Vehicle Weight = 19182kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	50% GVW	58% (FWA)	PASS
Secondary	:	25% GVW	24%	PASS (Locks)
Parking	:	12% GTW	12%	PASS

**** OVERALL RESULT: PASSED ****

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/296/AUTO

Example of Brake Test Report for 4-Axle HGV

DETAILED BRAKE TEST RESULTS - FULL TEST 952

DTp Number : 5243M TYPE APPROVED GVTS : Example
Vehicle Make: RENAULT Date : Wed 21/04/1999 Time : 09:38:42
Vehicle Type: 4 AXLE RIGID HGV GVW : 33000kg

AXLE 1 - 5154kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	1555kg	1555kg (L)
	O/S	Pass	Pass	Pass	1798kg (13%)	1798kg (L)

AXLE 2 - 6259kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	1921kg	1921kg (L)
	O/S	Pass	Pass	Pass	2151kg (10%)	2151kg (L)
Parking	N/S				1476kg	1476kg
	O/S				2052kg (28%)	2052kg

AXLE 3 - 7807kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		2417kg	2417kg (L)
	O/S	Pass	Pass		1920kg (20%)	1920kg (L)

AXLE 4 - 8237kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		1995kg	1995kg (L)
	O/S	Pass	Pass		1749kg (12%)	1749kg
Parking	N/S				1623kg	1623kg
	O/S				1401kg (13%)	1401kg

TEST SUMMARY
Measured Vehicle Weight = 27457kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	50% GVW	51% (FWA)	PASS
Secondary	:	25% GVW	25% (FWA)	PASS
Secondary	:	25% GVW	24%	PASS (Locks)
Parking	:	16% GVW	20%	PASS

**** OVERALL RESULT: PASSED ****

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/306/AUTO

Example of Brake Test Report for 4-Axle HGV

DETAILED BRAKE TEST RESULTS - FULL TEST 542

DTp Number : 5379L TYPE APPROVED GVTS : Example
Vehicle Make: LEYLAND DAF Date : Tue 30/03/1999 Time : 14:11:17
Vehicle Type: 4 AXLE RIGID HGV GVW : 32000kg

AXLE 1 - 5695kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	1938kg	1938kg
	O/S	Pass	Pass	Pass	1881kg (2%)	1881kg
Secondary	N/S				1008kg	1008kg
	O/S				1015kg (0%)	1015kg
Parking	N/S				1020kg	1020kg
	O/S				1086kg (6%)	1086kg

AXLE 2 - 5288kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	2282kg	2282kg (L)
	O/S	Pass	Pass	Pass	1964kg (13%)	1964kg (L)

AXLE 3 - 7444kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		2305kg	2305kg
	O/S	Pass	Pass		1898kg (17%)	1898kg (L)

AXLE 4 - 7102kg		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		2738kg	2738kg (L)
	O/S	Pass	Pass		1423kg (48%)	1423kg (L)
Secondary	N/S				1859kg	1859kg
	O/S				1964kg (5%)	1964kg (L)
Parking	N/S				1893kg	1893kg (L)
	O/S				2102kg (9%)	2102kg (L)

TEST SUMMARY
Measured Vehicle Weight = 25529kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	50% GVW	51% (FWA)	PASS
Secondary	:	25% GVW	18%	FAIL Alternative?
Parking	:	16% GVW	19%	PASS

**** OVERALL RESULT: FAILED ****

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/460/AUTO

Example of Brake Test Report for B-Prefix 3-Axle HGV

DETAILED BRAKE TEST RESULTS - FULL TEST 1024

DTp Number : B03479 TYPE APPROVED GVTS : Example
Vehicle Make: Date : Mon 26/04/1999 Time : 09:45:07
Vehicle Type: 3 AXLE RIGID HGV GVW : 17000kg GTW : 17000kg

AXLE 1 - 3780kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	1493kg	1493kg (L)
	O/S	Pass	Pass	Pass	1346kg (9%)	1346kg (L)

AXLE 2 - 4093kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		1279kg	1279kg (L)
	O/S	Pass	Pass		1373kg (6%)	1373kg (L)
Parking	N/S				1448kg	1448kg (L)
	O/S				1329kg (8%)	1329kg (L)

AXLE 3 - 2347kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		1008kg	1008kg (L)
	O/S	Pass	Pass		562kg (44%)	562kg (L)
Parking	N/S				986kg	986kg (L)
	O/S				579kg (41%)	579kg (L)

TEST SUMMARY *INSUFFICIENT LOAD ON AXLE 2, 3*

Measured Vehicle Weight = 10220kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	50% GVW	46% (FWA)	PASS (Locks)
Parking	:	16% GVW	26%	PASS

No Secondary brake calculations due to unknown split system

****** OVERALL RESULT: PASSED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/331/SEMI

Example of Brake Test Report for Pre-1968 2-Axle Semi-Trailer

DETAILED BRAKE TEST RESULTS - FULL TEST 1018

DTp Number : 244110 PRE 1968 GVTS : Example
Vehicle Make: Date : Sat 24/04/1999 Time : 11:45:41
Vehicle Type: 2 AXLE SEMI-TRAILER GVW : 34000kg TAW : 20200kg

AXLE 1 - 4549kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass			1566kg	1566kg
	O/S	Pass			1340kg (14%)	1340kg (L)
Parking	N/S				1504kg	1504kg (L)
	O/S				1390kg (7%)	1390kg (L)

AXLE 2 - 2155kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Fail			1724kg	1724kg
	O/S	Fail			2207kg (21%)	2207kg (L)

TEST SUMMARY *INSUFFICIENT LOAD ON AXLE 1, 2*

Measured Vehicle Weight = 6704kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	35% TAW	34%	FAIL
Parking	:	0% TAW	14%	PASS

UNSATISFACTORY WHEEL PERFORMANCE

AXLE/BRAKE	BIND		TIME LAG		OVALITY		IMBALANCE	MAX. FORCE	
	N/S	O/S	N/S	O/S	N/S	O/S		N/S	O/S
2/Service	141kg	124kg							

****** OVERALL RESULT: FAILED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/540/AUTO

Example of Brake Test Report for Post-1968 2-Axle Semi-Trailer

DETAILED BRAKE TEST RESULTS - FULL TEST 896

DTp Number : 241010 POST 1968 GVTS : Example
Vehicle Make: Date : Mon 19/04/1999 Time : 07:59:31
Vehicle Type: 2 AXLE SEMI-TRAILER GVW : 32000kg TAW : 20200kg

AXLE 1 - 5688kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass			2288kg	2288kg (L)
	O/S	Pass			1368kg (40%)	1368kg (L)
Parking	N/S				2023kg	2023kg (L)
	O/S				1324kg (34%)	1324kg (L)

AXLE 2 - 6808kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass			2784kg	2784kg (L)
	O/S	Pass			1942kg (30%)	1942kg (L)

TEST SUMMARY *INSUFFICIENT LOAD ON AXLE 1*

Measured Vehicle Weight = 12496kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	40% TAW	41%	PASS
Parking	:	16% GVW	10%	PASS (Locks)

**** OVERALL RESULT: PASSED ****

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/217/AUTO

Example of Brake Test Report for Type Approved 2-Axle Semi-Trailer

DETAILED BRAKE TEST RESULTS - FULL TEST 639

DTp Number : 245337 TYPE APPROVED GVTS : Example
Vehicle Make: Date : Tue 06/04/1999 Time : 09:20:44
Vehicle Type: 2 AXLE SEMI-TRAILER GVW : 36000kg TAW : 20200kg

AXLE 1 - 6032kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass			1690kg	1690kg (L)
	O/S	Pass			1418kg (16%)	1418kg (L)
Parking	N/S				1628kg	1628kg (L)
	O/S				1804kg (9%)	1804kg (L)

AXLE 2 - 6200kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass			1656kg	1656kg (L)
	O/S	Pass			1649kg (0%)	1649kg (L)
Parking	N/S				1978kg	1978kg (L)
	O/S				1853kg (6%)	1853kg (L)

TEST SUMMARY *INSUFFICIENT LOAD ON AXLE 1, 2*

Measured Vehicle Weight = 12232kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	45% TAW	32%	PASS (Locks)
Parking	:	16% GVW	20%	PASS

****** OVERALL RESULT: PASSED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/280/AUTO

Example of Brake Test Report for Type Approved 3-Axle Semi-Trailer

DETAILED BRAKE TEST RESULTS - FULL TEST 335

DTp Number : 307233 TYPE APPROVED GVTS : Example
Vehicle Make: Date : Sat 20/03/1999 Time : 09:01:19
Vehicle Type: 3 AXLE SEMI-TRAILER GVW : 34000kg TAW : 24000kg

AXLE 1 - 7484kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass			2243kg	2243kg
	O/S	Pass			2333kg (3%)	2333kg (L)
Parking	N/S				0kg	174kg
	O/S				0kg (0%)	132kg

AXLE 2 - 7793kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass			2282kg	2282kg (L)
	O/S	Fail			1666kg (26%)	1666kg
Parking	N/S				163kg	163kg
	O/S				943kg (82%)	943kg

AXLE 3 - 7512kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass			1865kg	1865kg
	O/S	Pass			1848kg (0%)	1848kg

TEST SUMMARY

Measured Vehicle Weight = 22789kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	45% TAW	51%	PASS
Parking	:	16% GVW	4%	FAIL

UNSATISFACTORY WHEEL PERFORMANCE

AXLE/BRAKE	BIND		TIME LAG		OVALITY		IMBALANCE	MAX. FORCE	
	N/S	O/S	N/S	O/S	N/S	O/S		N/S	O/S
1/Parking								174kg	132kg
2/Service		870kg							
2/Parking								163kg	

****** OVERALL RESULT: FAILED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/282/AUTO

Example of Brake Test Report for 3-Axle Semi-Trailer tested as an ULTAST

DETAILED BRAKE TEST RESULTS - FULL TEST 618

DTp Number : 308430 POST 1968 GVTS : Example
Vehicle Make: Date : Fri 02/04/1999 Time : 07:52:06
Vehicle Type: 3 AXLE SEMI-TRAILER GVW : 34500kg TAW : 24600kg

AXLE 1 - 1568kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass			727kg	727kg (L)
	O/S	Pass			507kg (30%)	507kg (L)
Parking	N/S				557kg	557kg (L)
	O/S				480kg (13%)	480kg (L)

AXLE 2 - 1482kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass			710kg	710kg (L)
	O/S	Pass			502kg (29%)	502kg (L)
Parking	N/S				749kg	749kg (L)
	O/S				507kg (32%)	507kg (L)

AXLE 3 - 1708kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass			619kg	619kg (L)
	O/S	Pass			518kg (16%)	518kg (L)

TEST SUMMARY *INSUFFICIENT LOAD ON AXLE 1, 2, 3*

Measured Vehicle Weight = 4758kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	40% TAW	15%	PASS (>=3000kg)
Parking	:	16% GVW	7%	PASS (>=1500kg)

****** OVERALL RESULT: PASSED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/291/AUTO/U

Example of Brake Test Report for 2-Axle Full Draw-Bar Trailer

DETAILED BRAKE TEST RESULTS - FULL TEST 214

DTp Number :
Vehicle Make:
Vehicle Type: 2 AXLE DRAWBAR TRAILER

GVTS : Example
Date : Fri 12/03/1999 Time : 10:38:24
GVW : 10200kg

AXLE 1 - 2364kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass			884kg	884kg (L)
	O/S	Fail			904kg (2%)	904kg

AXLE 2 - 3825kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass			1301kg	1301kg
	O/S	Pass			413kg (68%)	413kg
Parking	N/S				1307kg	1307kg
	O/S				336kg (74%)	336kg

TEST SUMMARY *INSUFFICIENT LOAD ON AXLE 1*

Measured Vehicle Weight = 6189kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	45% GVW	37% (FWA)	FAIL
Parking	:	16% GVW	16%	PASS

UNSATISFACTORY WHEEL PERFORMANCE

AXLE/BRAKE	BIND		TIME LAG		OVALITY		IMBALANCE	MAX. FORCE	
	N/S	O/S	N/S	O/S	N/S	O/S		N/S	O/S
1/Service		479kg							
2/Service							68%		

****** OVERALL RESULT: FAILED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/135/SEMI

Example of Brake Test Report for Pre-1968 2-Axle PSV

DETAILED BRAKE TEST RESULTS - FULL TEST 958

DTp Number : 074122 PRE 1968 GVTS : Example
Vehicle Make: Date : Wed 21/04/1999 Time : 14:05:43
Vehicle Type: 2 AXLE PSV

AXLE 1 - 2068kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	642kg	642kg (L)
	O/S	Pass	Pass	Pass	949kg (32%)	949kg (L)

AXLE 2 - 2509kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		980kg	980kg (L)
	O/S	Pass	Pass		904kg (7%)	904kg (L)
Secondary	N/S				749kg	749kg
	O/S				513kg (31%)	513kg
Parking	N/S				834kg	834kg
	O/S				546kg (34%)	546kg

TEST SUMMARY

Measured Vehicle Weight = 4577kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	50% ULW	76%	PASS
Secondary	:	22% LW	17%	FAIL
Parking	:	0% LW	19%	PASS

****** OVERALL RESULT: FAILED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/227/AUTO

Example of Brake Test Report for Post-1968 2-Axle PSV

DETAILED BRAKE TEST RESULTS - FULL TEST 1033

DTp Number : 134202 POST 1968 GVTS : Example
Vehicle Make: Date : Mon 26/04/1999 Time : 14:36:57
Vehicle Type: 2 AXLE PSV

AXLE 1 - 4719kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	1527kg	1527kg
	O/S	Pass	Pass	Pass	1390kg (8%)	1390kg

AXLE 2 - 5856kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		1837kg	1837kg (L)
	O/S	Pass	Pass		2069kg (11%)	2069kg (L)
Parking	N/S				1160kg	1160kg
	O/S				1936kg (40%)	1936kg

TEST SUMMARY

Measured Vehicle Weight = 10575kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	50% ULW	65%	PASS
Secondary	:	22% LW	22%	PASS
Secondary	:	25% ULW	37%	PASS
Parking	:	16% LW	23%	PASS

****** OVERALL RESULT: PASSED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/163/AUTO

Example of Brake Test Report for Re-Test of a 3-Axle Semi-Trailer

DETAILED BRAKE TEST RESULTS - Retest parking brake 589

DTp Number : 307233 TYPE APPROVED GVTS : Example
Vehicle Make: Date : Thu 01/04/1999 Time : 11:06:07
Vehicle Type: 3 AXLE SEMI-TRAILER GVW : 34000kg TAW : 24000kg

AXLE 1 - 7826kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Parking	N/S				2310kg	2310kg
	O/S				2262kg (2%)	2262kg

AXLE 2 - 8639kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Parking	N/S				3313kg	3313kg
	O/S				1898kg (42%)	1898kg

TEST SUMMARY

Measured Vehicle Weight = 24546kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Parking	:	16% GVW	29%	PASS

**** OVERALL RESULT: PASSED ****

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/165/AUTO

Example of Brake Test Report for Re-Test of a 2-Axle Tractor Unit

DETAILED BRAKE TEST RESULTS - Retest service and parking brake 688

DTp Number : 4968L TYPE APPROVED GVTS : Example
Vehicle Make: VOLVO Date : Thu 08/04/1999 Time : 08:09:31
Vehicle Type: 2 AXLE TRACTOR UNIT GVW : 19500kg GTW : 44000kg

AXLE 1 - 6053kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	1685kg	1685kg
	O/S	Pass	Pass	Pass	1009kg (40%)	1009kg
Parking	N/S				1797kg	1797kg
	O/S				1053kg (41%)	1053kg

AXLE 2 - 7336kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		631kg	631kg
	O/S	Pass	Pass		2416kg (73%)	2416kg (L)
Parking	N/S				710kg	710kg
	O/S				2521kg (71%)	2521kg (L)

TEST SUMMARY *INSUFFICIENT LOAD ON AXLE 2*
Measured Vehicle Weight = 13389kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	50% GVW	29%	FAIL
Parking	:	12% GTW	14%	PASS

UNSATISFACTORY WHEEL PERFORMANCE

AXLE/BRAKE	BIND		TIME LAG		OVALITY		IMBALANCE	MAX. FORCE	
	N/S	O/S	N/S	O/S	N/S	O/S		N/S	O/S
1/Service							40%		
2/Service							73%		

****** OVERALL RESULT: FAILED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/303/AUTO

Example of Brake Test Report for Re-Test of a 2-Axle HGV

DETAILED BRAKE TEST RESULTS - Retest service and parking brake 384

DTp Number : 3741 TYPE APPROVED GVTS : Example
Vehicle Make: RENAULT Date : Tue 23/03/1999 Time : 13:32:34
Vehicle Type: 2 AXLE RIGID HGV GVW : 5600kg GTW : 7500kg

AXLE 1 - 1547kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	614kg	614kg (L)
	O/S	Pass	Pass	Pass	744kg (17%)	744kg (L)

AXLE 2 - 1760kg

		BIND	TIME LAG	FALL-OFF	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	608kg	608kg (L)
	O/S	Pass	Pass	Pass	833kg (27%)	833kg (L)
Parking	N/S				591kg	591kg (L)
	O/S				811kg (27%)	811kg (L)

TEST SUMMARY *INSUFFICIENT LOAD ON AXLE 2*

Measured Vehicle Weight = 3307kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	50% GVW	52% (FWA)	PASS
Secondary	:	25% GVW	26% (FWA)	PASS
Secondary	:	25% GVW	26%	PASS
Parking	:	12% GTW	19%	PASS

****** OVERALL RESULT: PASSED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/143/AUTO

Example of Brake Test Report for a Voluntary Brake Test of a 2-Axle Semi-Trailer

DETAILED BRAKE TEST RESULTS - Voluntary test service and secondary and parkin100

DTp Number : 241010 POST 1968 GVTS : Example
Vehicle Make: Date : Tue 23/02/1999 Time : 12:51:59
Vehicle Type: 2 AXLE SEMI-TRAILER GVW : 32000kg TAW : 20200kg

AXLE 1 - 5564kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass			2266kg	2266kg (L)
	O/S	Pass			1799kg (20%)	1799kg (L)
Parking	N/S				2214kg	2214kg (L)
	O/S				1884kg (14%)	1884kg (L)

AXLE 2 - 6816kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass			2230kg	2230kg
	O/S	Pass			2327kg (4%)	2327kg (L)

TEST SUMMARY *INSUFFICIENT LOAD ON AXLE 1*

Measured Vehicle Weight = 12380kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	40% TAW	43%	PASS
Parking	:	16% GVW	13%	PASS (Locks)

****** OVERALL RESULT: PASSED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/323/AUTO

Example of Brake Test Report for a Voluntary Brake Test of a 2-Axle Tractor Unit

DETAILED BRAKE TEST RESULTS - Voluntary test service and secondary and parkin259

DTp Number : 5074S TYPE APPROVED
Vehicle Make: SCANIA
Vehicle Type: 2 AXLE TRACTOR UNIT

GVTS : Example
Date : Wed 03/03/1999
GVW : 19000kg

Time : 11:51:31
GTW : 50000kg

AXLE 1 - 6512kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	1783kg	1783kg (L)
	O/S	Pass	Pass	Pass	2557kg (30%)	2557kg (L)

AXLE 2 - 9093kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		3008kg	3008kg (L)
	O/S	Pass	Pass		2541kg (15%)	2541kg (L)
Secondary	N/S				2661kg	2661kg (L)
	O/S				2493kg (6%)	2493kg (L)
Parking	N/S				2798kg	2798kg
	O/S				2498kg (10%)	2498kg

TEST SUMMARY

Measured Vehicle Weight = 15605kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	50% GVW	55% (FWA)	PASS
Secondary	:	25% GVW	27%	PASS
Parking	:	12% GTW	11%	FAIL

****** OVERALL RESULT: FAILED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/160/AUTO

Example of Brake Test Report for a Voluntary Brake Test of a 2-Axle HGV

DETAILED BRAKE TEST RESULTS - Voluntary test service and secondary and parkin180

DTp Number :
Vehicle Make:
Vehicle Type: 2 AXLE RIGID HGV

GVTS : Example
Date : Fri 26/02/1999 Time : 15:39:08
GVW : 9600kg

AXLE 1 - 3419kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass	Pass	1451kg	1451kg (L)
	O/S	Pass	Pass	Pass	1505kg (3%)	1505kg (L)

AXLE 2 - 3528kg

		BIND	TIME LAG	OVALITY	IMBALANCE	MAX. FORCE
Service	N/S	Pass	Pass		1036kg	1036kg
	O/S	Pass	Pass		1297kg (20%)	1297kg
Parking	N/S				341kg	1141kg (L)
	O/S				544kg (37%)	1137kg

TEST SUMMARY *INSUFFICIENT LOAD ON AXLE 2*

Measured Vehicle Weight = 6947kg

BRAKE SYSTEM		PASS VALUE	TEST VALUE	RESULT
Service	:	50% GVW	63% (FWA)	PASS
Parking	:	16% GVW	24%	PASS

No Secondary brake calculations due to unknown split system

****** OVERALL RESULT: PASSED ******

Voluntary brake, light and emission tests for all types of vehicle are available in the VI Goods Vehicle Test Stations. Please ask for details at reception

985.0/V995.1/170/SEMI